

Chemical Age

Incorporating

PETROCHEMICALS and POLYMERS

VOL. 36 No. 2196

12 AUGUST 1961

**Further
specialised
processes
offered by**



W. J. Fraser's agreement with the COMPAGNIE DE SAINT GOBAIN of France enables them to supply plant for important processes under licence in the U.K. and Commonwealth Countries.

Examples are:

Phosphoric Acid (single reaction-tank process)

P.V.C. (bulk polymerisation process)

Malëic and Phthalic Anhydrides (improved process)

Complex Fertilisers

Triple Superphosphates

Ammonium Phosphates and Ammonium Sulpho-Phosphates

Limed Ammonium Nitrates

Plant for producing Phosphoric Acid by the single reaction-tank process. (Jointly developed by Union Chimique Belge and St. Gobain)



All enquiries should be sent to:—

W. J. FRASER & CO. LTD.

Harold Hill, Romford, Essex. Tel: Ingrebourne 45599 Grams: Pfaser, Romford, Telex. Works: Manks Bretton, Barnsley, Yorks.
And in AUSTRALIA · NEW ZEALAND · RHODESIA · SOUTH AFRICA · SPAIN

NOW!



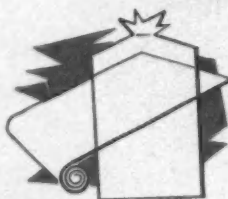
'Queensway'

Polythene Liners for the Chemical Industry

from Europe's largest maker of Polythene film

A NEW PACKAGING SERVICE You know British Visqueen Ltd. as polythene film producers (the largest in Europe), you know them as the acknowledged experts in polythene film packaging. Now meet them as the makers and printers of Queensway polythene liners.

Queensway liners give you four big advantages



1. Top quality polythene film selected from British Visqueen's wide range to your specification.

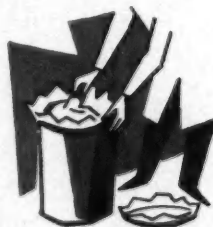


3. Wide knowledge of chemical industry requirements means that your problems are quickly understood and expertly solved.

2. Prompt delivery ensured by modern equipment and really big production capacity.



4. Reliable sealing plus effective protection backed by long experience in the whole field of polythene packaging.



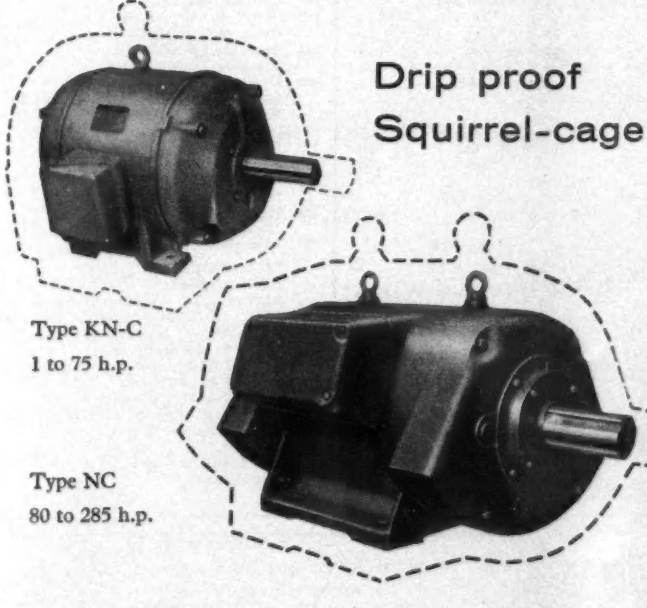

INTERNATIONAL PACKAGING EXHIBITION

Remember to visit the 'Visqueen' Stand No. 221 (YELLOW),
Ground Floor National Hall, Olympia, September 5th-15th, 1961.

BRITISH VISQUEEN LIMITED

Compact horse-power with class 'E' insulation

The use of class 'E' insulation—permitting a temperature rise of 65°C—makes these AEI squirrel-cage motors smaller for a given horse-power rating than the conventional class 'A' insulated machines.

 <p>Drip proof Squirrel-cage</p> <p>Type KN-C 1 to 75 h.p.</p> <p>Type NC 80 to 285 h.p.</p>	<p>Totally enclosed, fan-cooled Squirrel-cage</p>  <p>Type KN-D 1 to 40 h.p. <i>Larger TEFC machines available shortly</i></p>
---	---

AEI

Associated Electrical Industries Limited
Motor and Control Gear Division
RUGBY, BIRMINGHAM, & MANCHESTER

INDEX TO ADVERTISERS

The first figures refer to advertisements in Chemical Age Directory & Who's Who, the second to the current issue

Page	Page	Page	Page	Page	Page	
A.P.V. Co. Ltd., The	—	163	Brotherhood, Peter, & Co. Ltd.	—	Dunlop Rubber Co. Ltd. (G.R.G. Dunclad)	—
A. W. Instruments (Guildford) Ltd.	—	—	Brough, E. A., & Co. Ltd.	—	E.C.D. Ltd.	—
164 Acalor (1948) Ltd.	—	—	Brown, N. C., Ltd.	—	Electric Resistance Furnace Co.	—
African Pyrethrum Technical Information Centre	—	132	Bruno Pahlitzsch	—	Electro-Chemical Engineering Co.	—
148 Aimer Products Ltd.	—	—	Bryan Donkin Co. Ltd., The	—	Electrothermal Engineering Ltd.	—
121 Air Products Gt. Britain Ltd.	—	276	Bulk Liquid Transport Ltd.	—	Elga Products Ltd.	—
Air Trainers Link Ltd.	—	66	Bulwark Transport Ltd.	—	Book Mark Elliott, H. J., Ltd.	—
Alton & Co. Ltd.	—	194	Burnett & Rolfe Ltd.	—	Elliott Brothers (London) Ltd.	—
147 Albany Engineering Co. Ltd., The	—	124	Bush, W. J., & Co. Ltd.	—	145 Elmatic	—
155 Alginate Industries Ltd.	—	—	Butterfield, W. P., Ltd.	—	Endecotts (Filters) Ltd.	—
123 Allen, Edgar, & Co. Ltd.	—	—	Butterworths Scientific Publications	—	Evans Electro Selenium Ltd.	—
130 Allen, Frederick & Sons (Poplar) Ltd.	210	—	—	—	Evered & Co. Ltd.	—
160 Allis-Chalmers Great Britain Ltd.	—	245	Callow Rock Lime Co. Ltd., The	—	Farbwerke Hoechst A.G.	241
Alumina Co. Ltd., The	—	—	& 249 Calmic Engineering Co. Ltd.	—	Farnell Carbons Ltd.	212
Ancorite Ltd.	—	175	Carless, Capel, & Leonard Ltd.	—	156 Feltham, Walter H., & Co. Ltd.	—
Andrew Air Conditioning Ltd.	—	—	Causeway Reinforcement Ltd.	—	152 Ferris, J. & E., Ltd.	—
136 Anglo-Dal Ltd.	—	—	Chappell, Fred, Ltd.	—	279 Ferrostatics Ltd.	—
Anthony, Mark, & Sons Ltd.	—	—	Chemical Age Enquiries	243 & 244	Fielden Electronics Ltd.	—
211 Armour Hess Chemicals Ltd.	213	—	Chemical & Insulating Co. Ltd., The	—	171 Flight Refuelling Ltd.	—
Ashley Associates Ltd.	—	—	Chemicals & Feeds Ltd.	—	Fireproof Tanks Ltd.	—
Ashmore, Benson, Pease & Co. Ltd.	—	—	Chemieausstattungen Deutscher Innen-Und. Aubenhandel	—	185 Foxboro-Yoxall Ltd.	—
Associated Electrical Industries Ltd.	—	—	Chemolimpex	—	Fraser, W. J., & Co. Ltd.	Front Cover
Motor & Control Gear Division	209	—	Christy & Norris Ltd.	—	Freeman, William, & Co. Ltd.	—
Associated Electrical Industries Ltd.	—	—	Ciba Clayton Ltd.	—	Fullers' Earth Union Ltd., The	—
Turbine-Generator Division	—	—	Ciech Ltd.	—	122 G.Q. Parachute Co. Ltd.	—
153 Associated Lead Mfrs. Ltd.	Back Cover	—	164 Citenco Limited	214	168 Gallenkamp, A., & Co. Ltd.	—
G/Card Audco Limited	—	—	Classified Advertisements	242	Gascoigne, Geo. H., & Co. Ltd.	—
B.S.A. Small Tools Ltd.	—	—	169 Clayton, Son & Co. Ltd.	—	Geigy Co., Ltd., The	—
179 Baker Perkins Ltd.	—	—	138 Clydesdale Chemical Co. Ltd.	—	183 General Precision Systems Ltd.	—
173 Balfour, Henry, & Co. Ltd.	—	—	Cohen, George, Sons & Co. Ltd.	—	Glass Manufacturers' Federation	—
182 Barclay Kellett & Co. Ltd.	—	—	141 Cole, R. H., & Co. Ltd.	—	Giusti, T. & Sons Ltd.	—
138 Barytes (Shielding Products) Ltd.	—	—	Colt Ventilation Ltd.	—	Glebe Mines Ltd.	—
Begg, Cousland & Co. Ltd.	—	—	131 Comet Pump & Eng. Co. Ltd., The	—	Goodyear Pumps Ltd.	—
128 Belliss & Morcom Ltd.	—	269	Commercial Plastics Ltd.	—	167 Grainer Mfg. Co. Ltd.	—
165 Bennett, Sons & Shears Ltd.	—	—	Consolidated Zinc Corporation Ltd.	—	172 Greeff, R. W., & Co. Ltd.	—
G/Card Berk, F. W., & Co. Ltd.	237	—	Constable & Co. Ltd.	—	Halco (Bex Industrial)	—
138 Black, B., & Sons Ltd.	—	—	G/Card Constantin Engineers Ltd.	—	144 Haller & Phillips Ltd.	—
2 Blackman, Keith, Ltd.	—	—	Constructors John Brown, Ltd.	—	Hamilton Company Inc.	—
Blaw, Knox Chemical Engineering Co. Ltd.	—	—	Controlled Convection Drying Co.	—	156 Harris (Lostock Gt. Britain) Ltd.	—
190 Blundell & Crompton Ltd.	—	—	Cooke, Troughton & Simms Ltd.	—	Harvey, G. A., & Co. (London) Ltd.	—
Boby, William, & Co. Ltd.	—	—	Coulter Electronics Ltd.	—	6 Haworth, F. (A.R.C.) Ltd.	—
Borax & Chemicals Ltd.	—	—	Cromil & Piescy Ltd.	216	Hearfield Industries Ltd.	—
205 Borax Consolidated Ltd.	—	—	Crosfield, Joseph, & Sons Ltd.	239	Hearson, Charles, & Co. Ltd.	—
4 Boulton, William, Ltd.	—	—	Crossley, Henry (Packings) Ltd.	—	Helmets Ltd.	—
Braby, Frederick, & Co. Ltd.	—	180	Crow Carrying Co. Ltd., The	216	161 Hercules Power Co. Ltd.	—
Brackett, F. W., & Co. Ltd.	—	133	Cruickshank, R., Ltd.	—	Hindie, Joshua, & Sons Ltd.	—
265 British Acheson Electrodes Ltd.	—	159	Curran, Edward, Engineering Ltd.	—	164 Holden, Chris., Ltd.	—
132 British Carbo Norit Union	—	219	Cyanamid of Great Britain Ltd.	—	Humphreys & Glasgow Ltd.	—
British Ceca Co. Ltd., The	—	213	Cyclo Chemicals Ltd.	—	151 Huntingdon, Heberlein & Co. Ltd.	—
193 British Celanese Ltd.	211	126	Cyclops Engineering Co. Ltd., The	—	I.C.I. (Billingham)	217
British Drug Houses Ltd., The	—	235	Dalglish, John, & Sons Ltd.	—	I.C.I. Catalysts	—
154 British Ermeto Corporation Ltd.	—	152	Danks of Netherthorn Ltd.	—	I.C.I. General Chemicals Division	215
Spine British Geon Ltd.	—	136	Davey & Moore Ltd.	—	I.C.I. Ltd. Heavy Organic Chemicals	—
271 British Labour Pump Co. Ltd.	—	144	Davey, Paxman & Co. Ltd.	—	I.C.I. Metals Titanium D.	—
British Lead Mills Ltd.	—	—	Davy & United Instruments Ltd.	—	I.C.I. Nobel Chemicals	—
G/Card British Oxygen Company Ltd. (Heavy Industrial Dept.)	—	140	Dawson, McDonald & Dawson Ltd.	—	I.C.I. Plastics—Darvic	—
146 British Rototherm Co. Ltd., The	—	143	Deutsche Steinzeugwarenfabrik	216	I.C.I. Plastics—Fluon	—
122 British Steam Specialties Ltd., The	—	139	Distillers Co. Ltd., The (Chemical Div.)	—	I.C.I. Plastics—Kralastic	—
126 British Tar Products Ltd.	—	—	Distillers Co. Ltd., The (Industrial Group)	—	I.C.I. Ltd. (Plastics Division), Corvic	—
British Thomson-Houston Co. Ltd., The	—	135	Dorr-Oliver Co. Ltd.	—	I.C.I. (Fluorube) Ltd.	—
G/Card British Titan Products Co. Ltd.	—	131	Doulton Industrial Porcelains Ltd.	—	I.M.P.A. Ltd.	—
British Visqueen Ltd.	—	—	Dow Chemical International S.A.	—	Interscience Publishers Ltd.	—
321 Broadbent, Thomas, & Sons Ltd.	Cover II	154	Dowlow Lime & Stone Co. Ltd.	—	Isopad Ltd.	—
—	—	127	Dryden, T., Ltd.	—	—	—

Continued on page 212

(Continued on page 212)

FOR CALCIUM SULPHATE PURE PRECIP.

CONSULT

FREDERICK ALLEN & SONS (POPLAR) LTD.

PHOENIX CHEMICAL WORKS, UPPER NORTH STREET, LONDON, E.14.

Telephone: EAST 2673 (5 lines)

Cables: NITRIC, POP, LONDON

BRITISH CELANESE LIMITED

expanding in chemicals

the many

'Celanese' chemicals

and allied products

include

orders large or small

Celanese resources are geared to bulk shipments, but small orders receive equally prompt and careful attention

Write for information and samples to:—

Chemical Sales Department

BRITISH CELANESE LIMITED

Foleshill Road, Coventry

Telephone: 88771



INDEX TO ADVERTISERS

The first figures refer to advertisements in Chemical Age Directory & Who's Who, the second to the current issue

Page		Page		Page		Page	
174	Jackson, J. G., & Crockett Ltd.	—	190	Nailsea Engineering Co. Ltd.	—	—	Sharples Centrifuges Ltd.
172	Jamesales Ltd.	—	—	National Coal Board	—	3	Sheepbridge Equipment Ltd.
—	Jenkins, Robert, & Co. Ltd.	—	—	National Industrial Fuel Efficiency Service	—	—	Shell Chemical Co. Ltd.
—	Johnson, Matthey & Co. Ltd.	—	118	Neckar Water Softener Co. Ltd.	—	—	Shell-Mex & B.P. Ltd.
128	Johnsons of Hendon Ltd.	—	149	Negretti & Zambra Ltd.	—	—	Shell Industrial Oils
—	Jones & Stevens Ltd.	—	—	Newnes, George, Ltd.	—	—	Shirley, Aldred, & Co. Ltd.
—	—	—	—	Back Cover Newton Chambers & Co. Ltd.	—	197	Siebe, Gorman & Co. Ltd.
186	K.D.G. Instruments Ltd.	—	—	Nordac Ltd.	—	157	Silvercrown Limited
—	K & K Laboratories Ltd.	—	—	Normalair Ltd.	—	40	Simon, Richard, & Sons Ltd.
170	K.W. Chemicals Ltd.	—	—	Northgate Traders (City) Ltd.	—	—	Sipon Products Ltd.
—	Kaylene (Chemicals) Ltd.	—	—	Nuovo Pignone	—	—	Sojuzchimexport
198	Kellie, Robert, & Sons Ltd.	—	162	Odoni, Alfred A., & Co. Ltd.	—	267	Southern Analytical Ltd.
—	Kellogg International Corporation	—	190	Optical-Mechanical (Instruments) Ltd.	—	—	Spence, Peter, & Sons Ltd.
180	Kenton Fluorescent Mfg. Co.	—	—	Orthos (Engineering) Ltd.	—	199	Spencer, Chapman & Messel Ltd.
166	Kernick & Son Ltd.	—	—	Oxford Paper Sack Co. Ltd.	—	—	Spencers Joinery Ltd.
319	Kestner Evaporator & Engineering Co. Ltd.	—	—	—	—	223	Standard Chemical Co.
—	Kestner Evaporator & Engineering Co. Ltd.	—	—	—	—	320	Stanton Instruments Ltd.
—	(Keebush)	—	—	G/Card P.G. Engineering Ltd.	—	—	Staveley Iron & Chemical Co. Ltd.
—	Klinger, Richard, Ltd.	—	—	Palfrey, William, Ltd.	—	182	Steel Drums Ltd.
—	—	—	—	Peebles, Bruce & Co. Ltd.	—	196	Steel, J. M., & Co. Ltd.
—	Laboratory Apparatus & Glass Blowing Co.	—	215	Penrhyn Quarries Ltd.	212	196	Sturge, John & E., Ltd.
—	Laboratory & Electrical Engineering Co.	—	—	Permutit Co. Ltd., The	—	—	Super Oil Seals & Gaskets Ltd.
176	Laboratory Glasblowers Co.	—	—	G/Card Petrocarbon Developments Ltd., The	—	—	Surface Protection Ltd.
—	Langley Alloys Ltd.	—	188	Petroderivatives Ltd.	—	192	Synthite Ltd.
124	Lankro Chemicals Ltd.	—	—	Pfizer Ltd. (Chemical Division)	—	—	—
G/Card	Laporte Chemicals Ltd.	—	—	Pickfords Limited	—	191	Taylor Rustless Fittings Co. Ltd.
—	Laporte Industries Ltd.	—	—	Pickstone Limited	—	194	Thermal Syndicate Ltd., The
—	Lechler, Paul Firma	—	—	Plastic Constructions Ltd.	—	—	Tidy, S. M. (Haulage) Ltd.
134	Leek Chemicals Ltd.	—	140	Plastic Filters Ltd.	—	156	Titanium Metal & Alloys Ltd.
176	Leigh & Sons Metal Works Ltd.	214	184	Platon, G. A., Ltd.	—	—	Todd Bros. (St. Helens & Widnes) Ltd.
—	Lennig, Charles & Co. (Great Britain) Ltd.	—	—	Podmores (Engineers) Ltd.	—	168	Towers, J. W., & Co. Ltd.
—	Lennox Foundry Co. Ltd.	—	257	Polypenco Ltd.	—	261	Tylors of London Ltd.
—	Light, L., & Co. Ltd.	—	251	Polysius Ltd.	—	—	—
181	Lind, Peter, & Co. Ltd.	—	195	Pool, J. & F., Ltd.	—	—	Uhde, Friedrich, GmbH
—	Lloyd & Ross Ltd.	—	—	Pott, Cassels & Williamson Ltd.	Cover iii	180	Unicono Co. Ltd., The
177	Lock, A. M., & Co. Ltd.	—	—	Potter, F. W., & Soar Ltd.	—	200	Unifloc Ltd.
—	Longman Green & Co. Ltd.	—	253	Powell Duffryn Carbon Products Ltd.	—	—	Unilever Ltd.
162	Longworth Scientific Instruments Co.	—	—	G/Card Power-Gas Corporation Ltd.	—	—	Union Carbide Ltd.
188	Lord, John L., & Son	—	146	Price Stutfield & Co. Ltd.	—	170	United Coke & Chemicals Co. Ltd.
—	Loughborough Glass Co. Ltd.	—	—	Prodorite Ltd.	—	196	United Filter & Engineering Co. Ltd., The
—	Low & Bonar Ltd.	—	—	Price's (Bromborough) Ltd.	—	—	United Wire Works Ltd., The
—	Lurgi Verwaltung GmbH	—	—	Pye, W. G., & Co. Ltd.	—	G/Card	Universal-Matthey Products Ltd.
—	Luma (U.K.) Ltd.	—	—	Pyrene Co. Ltd.	—	—	—
—	—	—	—	Pyrene-Panorama Ltd.	—	—	Volerepe Ltd.
162	McCarthy, T. W., & Sons	214	—	Q.V.F. Ltd.	—	188	W.E.X. Traders Ltd.
188	McMurray, F. J.	—	—	Quickfit & Quartz Ltd.	—	189	Walker, P. M., & Co. (Halifax) Ltd.
187	Maine, B. Newton, Ltd.	—	—	—	—	8	Waller, George, & Son Ltd.
134	Manesty Machines Ltd.	—	154	Reade, M. G.	—	—	Ward, Thomas W., Ltd.
129	Marchon Products Ltd.	235	241	Reads Ltd.	—	—	Warren-Morrison Ltd.
—	May & Baker Ltd.	—	—	Reavell & Co. Ltd.	—	148	Watson, Laidlow, & Co. Ltd.
—	Mechams Ltd.	—	—	Recontainers Limited	—	—	Watson-Marlow Air Pump Co.
—	Front Cover Metal Containers Ltd.	—	—	Rheem Lysaght Ltd.	—	125	Wellington Tube Works Ltd.
G/Card	Metalock (Britain) Ltd.	—	—	Rhodes, B. & Son Ltd.	—	242	Whitaker, B., & Sons Ltd.
146	Metcalf & Co.	—	—	Richardson Scale Co. Ltd.	—	—	Widnes Foundry & Engineering Co. Ltd.
—	Metering Pumps Ltd.	—	—	Richmond Welding Co. Ltd.	—	253	Wilcox, W. H., & Co. Ltd.
—	Metrinplex	—	243	Rosin Engineering Co. Ltd.	—	137	Wilkinson, James, & Son Ltd.
—	Metropolitan-Vickers Electrical Co. Ltd.	—	—	Ross Ensign Ltd.	—	142	Williams & James (Engineers) Ltd.
130	Middleton & Co. Ltd.	—	260	Rotameter Manufacturing Co. Ltd.	—	—	Witco Chemical Co. Ltd.
—	Mirrless Watson Co. Ltd., The	—	—	—	—	142	Wood, Harold, & Sons Ltd.
178	Mirvale Chemical Co. Ltd., The	—	192	S.P.E. Company Ltd.	—	184	Worcester Royal Porcelain Co. Ltd.
—	Mitchell, L. A., Ltd.	—	—	Sandiacre Screw Co. Ltd., The	—	—	—
120	Mond Nickel Co. Ltd., The	—	—	Saunders Valve Co. Ltd.	—	—	Yorkshire Engineering & Welding Co.
—	Monkton Motors Ltd.	240	—	Scientific Design Co. Inc.	—	150	(Bradford) Ltd.
—	Monsanto Chemicals Ltd.	—	—	Scientific Glass Blowing Co.	—	—	Yorkshire Tar Distillers Ltd.
—	Morgan Refractories Ltd.	—	—	Scott, Bader & Co. Ltd.	—	—	Young, A. S., & Co.
178	Moritz Chemical Engineering Co. Ltd.	—	174	Scottish Tar Distillers Ltd.	—	150	Zeal, G. H., Ltd.

Decolorising CARBON

ALL GRADE
FOR
ALL TRADES

HIGHEST EFFICIENCY
LOWEST PRICES

Granular Carbon for Solvent Recovery
Regeneration of Spent Carbon

Write for samples and quotations.

FARNELL CARBONS LIMITED
CONDUIT ROAD, PLUMSTEAD, LONDON, S.E.18

Telephone:
Woolwich 1158 (2 lines)

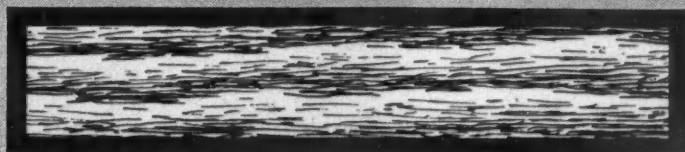
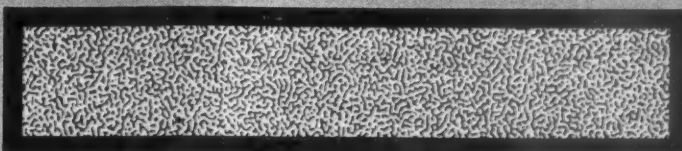
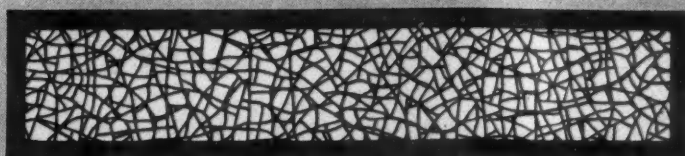
Telegrams:
Scofar, Wal, London

"Fullersite"

SLATE FILLER

WHEREVER AN INERT FILLER
IS REQUIRED FULLERSITE
IS THE IDEAL MATERIAL

PENRHYN QUARRIES LTD.
PORT PENRHYN, BANGOR, NORTH WALES

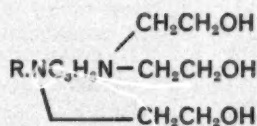


ETHO CHEMICALS

Many uses for 3 new surface active chemicals*

ETHODUOMEEN T/13

Formula:



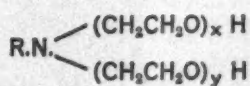
where R denotes tallow fatty acid radical

A double tertiary amine and an intermediary in the synthesis of other products

Corrosion inhibitor in cutting oils, asphalt additive, emulsifier

ETHOMEEN C/25

Formula:



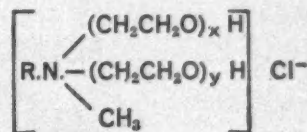
where R denotes the coco alkyl group and $x + y = 15$

A water-soluble tertiary amine which behaves like a nonionic compound

Detergent in metal cleaning formulations, additive in viscose spinning, and in paint strippers

ETHOQUAD C/25

Formula:



An undiluted quaternary compound liquid at room temperature

Emulsifier, bactericide, anti-static agent

* Now available in large quantities.

ASK FOR FURTHER INFORMATION AND SAMPLES



ARMOUR HESS CHEMICALS LIMITED



6 ARLINGTON STREET • ST JAMES'S • SW1. TELEPHONE: HYDe Park 7831

FIRST FIND THE RIGHT PEOPLE

A leading technical college chose TRF, the Stainless Steel specialists, to build this Fermentor. Why TRF?

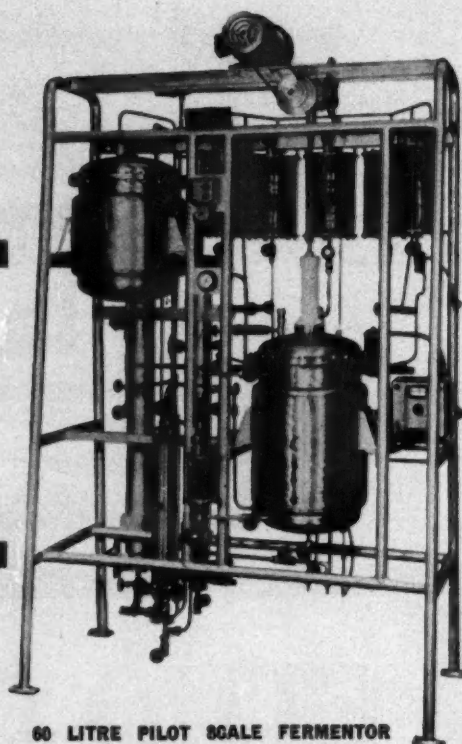
Because, very sensibly, they preferred to deal with the specialists . . . the people with the right solution to Stainless Steel problems. Stainless Steel could be playing a major part in *your* new plant. Much better speak to the right people about it . . . TRF.



TAYLOR RUSTLESS FITTINGS CO LTD

HEAD OFFICE: RING ROAD, LOWER WORTLEY, LEEDS
Tel: LEEDS 638711

LONDON OFFICE: 14 GREAT PETER ST. LONDON, W.1
Tel: Abbey 1576

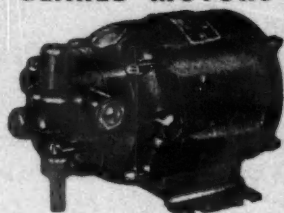


60 LITRE PILOT SCALE FERMENTOR
WITH MEDIUM PREPARATION VESSEL
AND GLASS ADDITIONAL VESSELS.



WORLD FAMOUS FRACTIONAL HORSE-POWER GEARED MOTORS

Output-shaft has 12 positions.
Integral Wormgear Reduction.
Ventilated—Drip Proof.
Vacuum Impregnated Windings.
Dynamically balanced Armatures and Rotors.



SERIES WOUND GEARED MOTOR—Type 'K'

R.P.M. - TORQUE	R.P.M. - TORQUE
600 10 oz. in. 37.5 4 lb. in.	
300 16 oz. in. 25 4 lb. in.	
150 24 oz. in. 18.8 4 lb. in.	
100 32 oz. in. 12.5 4 lb. in.	
75 36 oz. in. 9.4 4 lb. in.	
50 3 lb. in. 6.25 4 lb. in.	

SHADED-POLE INDUCTION GEARED MOTOR—Type 'FA'

R.P.M. - TORQUE	R.P.M. - TORQUE
216 4 oz. in. 13.5 24 oz. in.	
108 7 oz. in. 9 30 oz. in.	
54 10 oz. in. 6.7 35 oz. in.	
36 12 oz. in. 4.8 44 oz. in.	
27 15 oz. in. 3.35 3 lb. in.	
18 20 oz. in. 2.25 4 lb. in.	

VARIABLE SPEED GEARED MOTOR—Type 'KQ'

R.P.M. - TORQUE	R.P.M. - TORQUE
200-600 9 oz. in. 12-37.5 4 lb. in.	
100-300 16 oz. in. 8-22 4 lb. in.	
50-150 20 oz. in. 6-16.5 4 lb. in.	
32-100 32 oz. in. 4-11 4 lb. in.	
25-75 40 oz. in. 3-8.25 4 lb. in.	
16-50 48 oz. in. 2-5.5 4 lb. in.	

CAPACITOR INDUCTION GEARED MOTOR—Type 'N'

R.P.M. - TORQUE	R.P.M. - TORQUE
456 8 oz. in. 28.5 3 lb. in.	
228 13 oz. in. 19 4 lb. in.	
114 21 oz. in. 14.2 4 lb. in.	
76 26 oz. in. 9.5 4 lb. in.	
57 32 oz. in. 7.1 4 lb. in.	
38 44 oz. in. 4.75 4 lb. in.	

(Dept. CASB) **CITENCO** LIMITED

MANOR WAY · BOREHAM WOOD · HERTS · ENGLAND

Telegram: Citenco Borehamwood Telephone: Elstree 5666-7-8

GLASSBLOWING



Prompt delivery our speciality
OFFICIAL DISTRIBUTORS OF QUICKFIT
and QUARTZ GLASSWARE

We welcome your enquiries
Micro and Semi Micro
apparatus available from stock

**T. W. MCCARTHY
& SON, LTD**

Complete Laboratory Furnishers

30a Clifton Street, Cardiff

Telephone: Cardiff 26251

"ZULO"

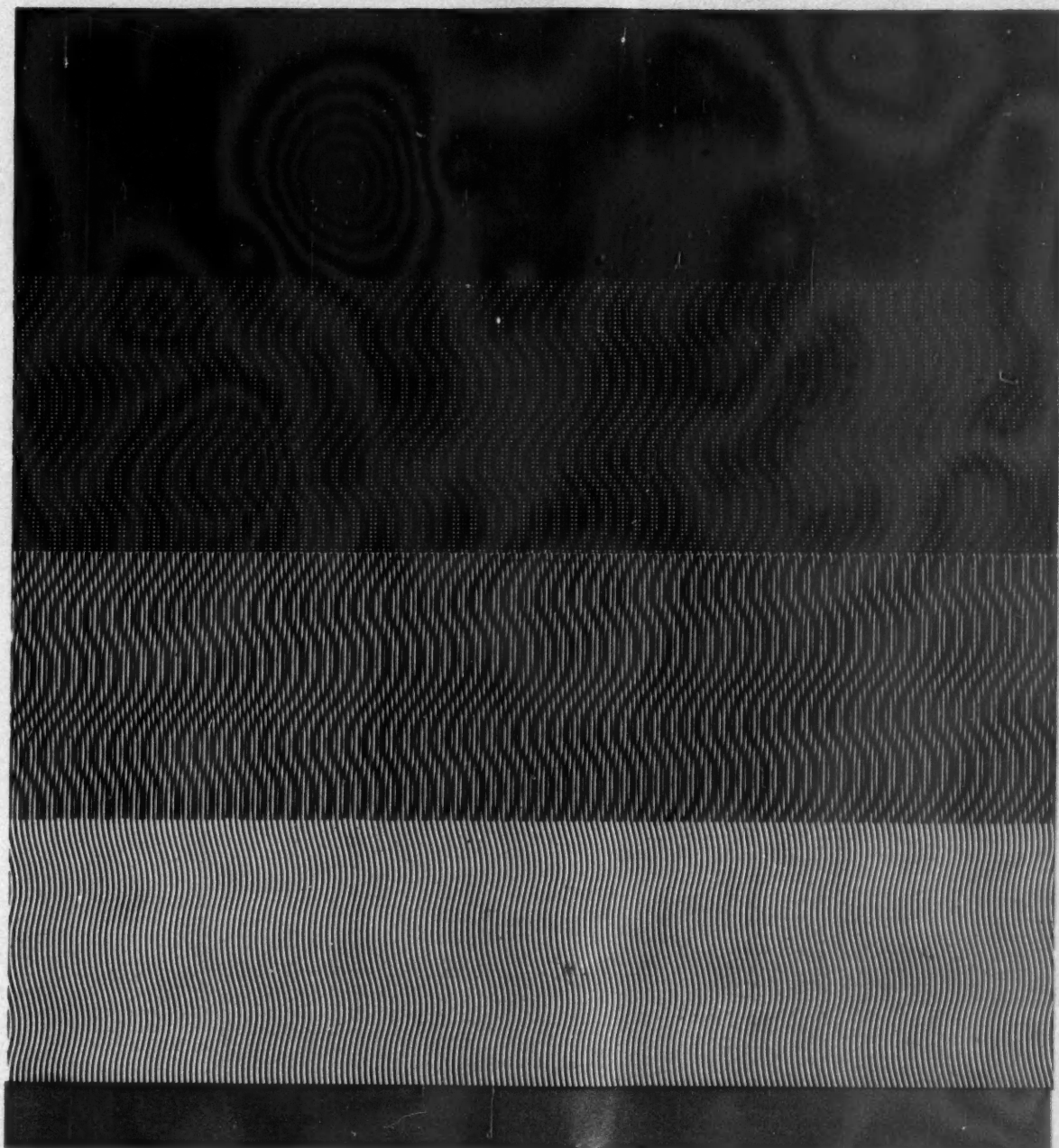


CARBOYS HAMPERS

**LEIGH
& SONS
METAL
WORKS**

Orlando LTB.
St. BOLTON

CARBOYS · PACKED CARBOYS
CARBOY TILTERS AND BARROWS
SAFETY CRATES TOP PROTECTORS



Reduce fire risk



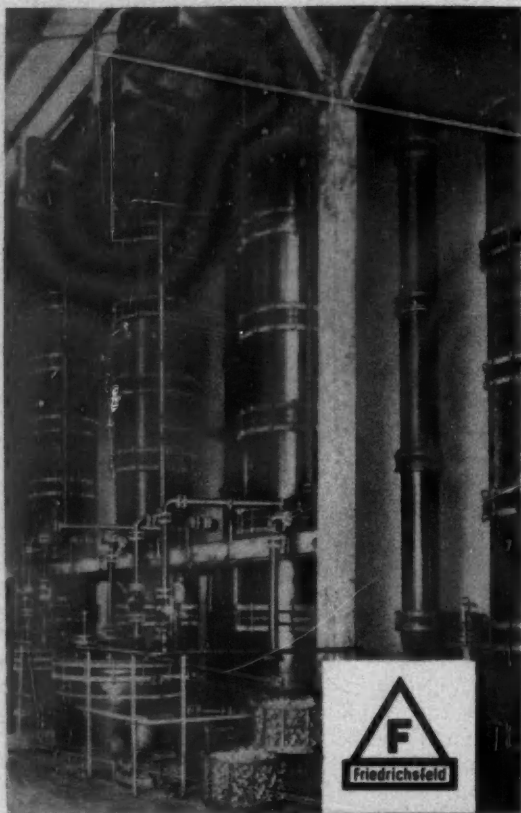
IMPERIAL CHEMICAL INDUSTRIES LTD.
LONDON, S.W.1.

Use an I.C.I. non-inflammable solvent

TRICHLOROETHYLENE
METHYLENE CHLORIDE
PERCHLOROETHYLENE
CHLOROFORM

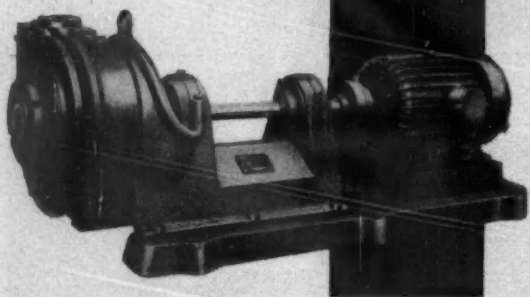
for extraction processes for oils, fats, waxes,
pharmaceuticals and fine chemicals
for dry-cleaning, metal degreasing and
formulating paint-removing compositions.

GC 14



We supply products of:
STONEWARE,
 acid proof as well as temperature
 resistant,
TECHNICAL PORCELAIN,
SYNTHETIC RESIN, SYNTHETIC CARBON,
ELECTRO GRAPHITE

Installations, Apparatus & Equip-
 ment such as Columns, Bleaching
 Plants, Pumps, Exhausters, Heat-
 exchangers, Valves, Tubes, Vessels,
 Sinks, Filters, Rollers, etc., and
 equipment to customers' speci-
 fications.



**DEUTSCHE STEINZEUGWARENFABRIK
 MANNHEIM-FRIEDRICHSFELD**

Sole representative:—

ANDERMAN & COMPANY LIMITED
 BATTLEBRIDGE HOUSE, 87-95 TOOLEY STREET, LONDON, S.E.1

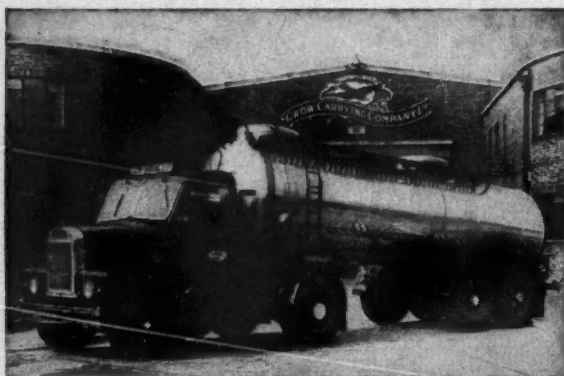
Tel: HOP 8835/6 & HOP 1169. Telegraphic Address: Deran, Phone, London

CROMIL & PIERCY LTD.



GRAPHITE
 IN ALL FORMS

MILBURN HOUSE
 "E" FLOOR
NEWCASTLE-ON-TYNE
 Tel: 2-7761



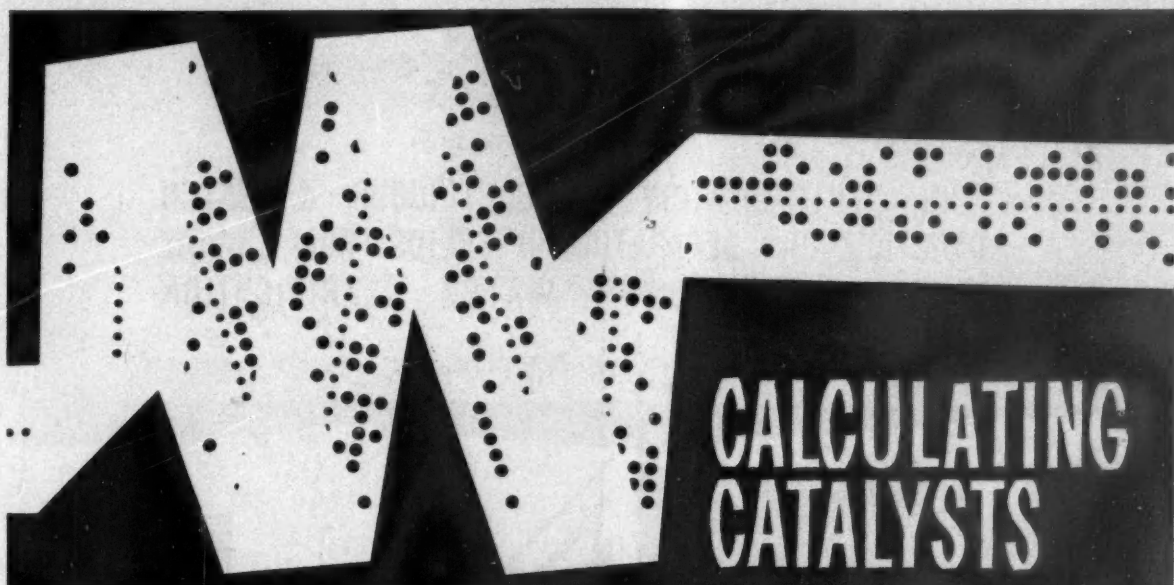
At your service . . . a fleet of
TANKERS for the **TRANSPORT**
 of

**BULK
 LIQUIDS
 POWDERS
 and
 GASES**

**CROW
 CARRYING
 CO. LTD.**

HARTS LANE, NORTH STREET
 BARKING, ESSEX
 Telephone: Rippleway 0366

and
 231 GREENGATE, MIDDLETON
 JUNCTION, MIDDLETON
 MANCHESTER
 Telephone: Fallowfield 3353



CALCULATING CATALYSTS



CALCULATING CATALYSTS FOR CO SHIFT CONVERSION new I.C.I. computer service

Are you designing a new unit? Or seeking optimum performance from your present plant? If so, I.C.I. can help you. One of the electronic computers at Billingham has recently been programmed to calculate the performance of I.C.I. catalyst 15-2 under a wide range of conditions. **Send us the basic information and we will carry out this service for you.**

I.C.I. catalyst 15-2 is the latest I.C.I. shift-conversion catalyst, and the most active we have made in 25 years. We use it to produce hydrogen for ammonia synthesis, but nowadays there is increasing interest in the use of this catalyst for other manufacturing processes, including:

- detoxification of town gas
- CO removal from industrial gases
- production of gases for metal treatment atmospheres
- production of gases for organic hydrogenation processes

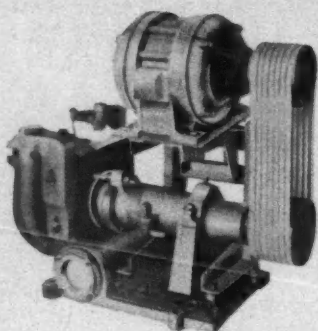


IMPERIAL CHEMICAL INDUSTRIES LIMITED, LONDON, S.W.1.

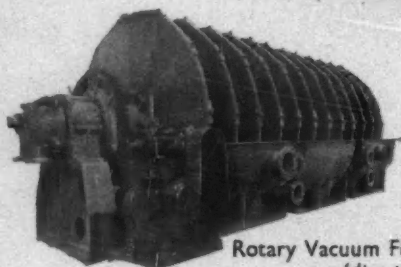
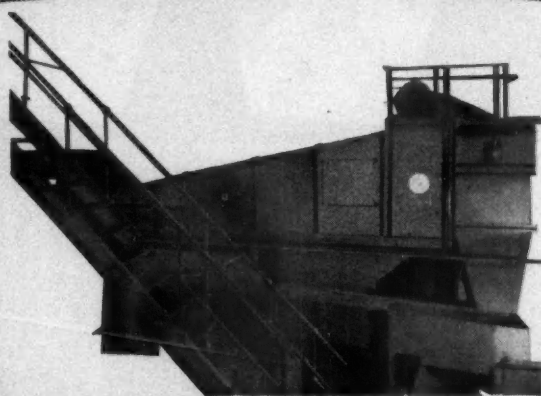
PLANT FOR

ACID NEUTRALIZATION • CONTINUOUS & BATCH
CAUSTICIZING • SEPARATION OF SOLIDS FROM LIQUIDS
WATER FILTRATION • WATER CLARIFICATION

"WEMCO"
SAND &
SLURRY
PUMP
IN
"N.I." HARD



D.M.5 Dense Media Separator

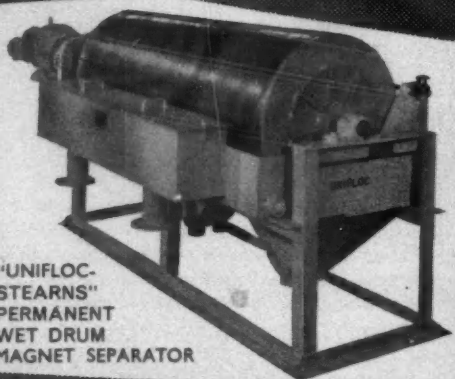


Rotary Vacuum Filter
(disc type)

Equipment includes:

AGITATORS & MIXERS • CAUSTICIZERS
CLARIFIERS • CONDITIONERS • CONVEYORS
CENTRIFUGAL SAND PUMPS • DIAPHRAGM
PUMPS (PRESSURE TYPE) • ELEVATORS
FROTH FLOTATION CELLS • ROTARY
VACUUM FILTERS • PADDLE MIXERS
SLUDGE PUMPS • THICKENERS • STRING
DISCHARGE FILTERS • VIBRATING SCREENS
MAGNETIC SEPARATORS

"UNIFLOC-
STEARNS"
PERMANENT
WET DRUM
MAGNET SEPARATOR



unifloc

VOL. 86

No. 2196

AUGUST 12 1961

Telephone: FLEet Street 3212 (26 lines)
 Telegrams: Benformula - London E.C.4

Editor
 M. C. HYDE

Manager
 R. C. BENNETT

Director N. B. LIVINGSTONE WALLACE

Midland Office

Daimler House, Paradise Street,
 Birmingham. [Midland 0784-5]

Leeds Office

Permanent House, The Headrow,
 Leeds 1. [Leeds 22601]

Scottish Office

116 Hope Street, Glasgow C2.
 [Central 3954-5]

IN THIS ISSUE

Italian Plans for Ferrandina	220
Project News: Manderstam and U.A.R.; C.J.B. Tonnox Units for Poland; Nitrogen Industry in Eire; Polymer drop U.K. Butyl Plans	221
Coal Tar for Buried Pipes	223
Distillates	224
Improved Chemicals Handling	225
New Canadian TiO ₂ Process	226
Shawinigan's Olefin Plans	227
U.K. Acid Output Rises	227
Determination of Caffeine	228
Overseas News	229
Bookshelf	232
People in the News	233
Commercial News	234
Appreciation of Norman Sheldon	236
Market Reports	236
New Patents	238
Trade Notes	240

Annual subscription is: home, 57s 6d,
 overseas, 65s, single copies 1s 9d (by
 post 2s)

Chemical Age

incorporating

PETROCHEMICALS and POLYMERS

BOUVERIE HOUSE • 154 FLEET STREET • LONDON • EC4

PROFIT TRENDS

THERE are signs that the U.S. chemical industry is recovering from its setbacks and that 1961 sales will be substantially up on 1960. Already the second quarter profits of large American chemical producers have shown improvements, although they are still far short of the record levels of early 1959.

On the other hand, sales have returned to the high levels of a year ago. After the worst first-quarter since 1958, it appears that the industry is returning to better conditions.

If this upswing continues in the third and final quarters, then the U.S. chemical industry will have had a good year, with what might well be record sales, but with the squeeze still on profit margins.

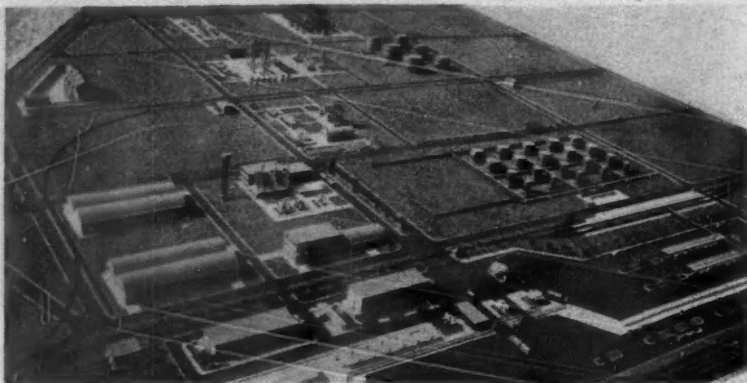
So far as the British chemical industry is concerned, profits and sales were generally up last year, but most of the chairmen who have publicly reported on trading conditions during 1961 have gone on record as saying that lower profits must be expected. Tax increases in the Budget, followed by the Chancellor's more recent austerity measures, are not likely to help. It is not felt that the slight addition to purchase tax rates will have much affect on sales of consumer goods, although the new, more stringent hire-purchase terms for cars might well have an adverse affect.

The chemical industry in Europe has this year been learning something of the difficulties of over-capacity that have beset the U.S. industry for some time. As things stand now, there is likely to be serious overcapacity in synthetic organics on both sides of the Atlantic for some time to come. Two immediate effects of this are to hit plant economics and to increase greatly the problems of competing in world markets at a time most major producers have extra capacity on their hands.

As Mr. David H. Dawson, vice-president of E. I. du Pont de Nemours and Co., aptly put it at a recent meeting of U.S. financial analysts, "The advent of the 1960's finds the chemical industry in an increasingly competitive scramble for markets. This has had profound effects on marketing and selling practices, all in the direction of higher marketing costs."

Certainly, most chemical companies are today spending far more on technical service departments than they were a year or two ago. The reasons are many and cover the need to develop new applications and to give sound advice on more complex products. There can be no doubt that customer-firms will give their business to the producer who helps them solve their problems and increase their earnings.

Although in the short term the pressure will doubtless continue on profit margins, Mr. Dawson believes, as indeed do most of the world's large chemical producers, that taking a longer view there are boundless opportunities ahead for chemical industry expansion. Some of the larger opportunities are self-evident: the replacement of large volumes of glass, paper, wood, leather and metals; further replacement of natural fibres by synthetics and the development of techniques to replace cumbersome techniques of converting fibres into textile products; chemical control of the still unconquered diseases; provision of adequate food supplies for a rapidly expanding world population.



Model of the projected Montecatini units at Ferrandina

Italian Plans for Petrochemical Complex at Ferrandina

THE recent discovery of considerable deposits of methane at Ferrandina, Italy, will mean the transformation of this previously under-developed area into an important industrial centre. Three of Italy's most important companies, Montecatini, A.N.I.C. and Ceramica Pozzi, are building plants there. As stated in C.A., 29 July, p. 166, construction began on 29 July.

Montecatini are building a plant for the production of 60,000 tonnes of plastics materials and derivatives a year. It will be operated by Industrial Chimica del Basento, a member of the Montecatini Group. The plants, which will go on stream during 1963, represent an investment of Lire 15,000 million (£8.5 million) and will use 300,000 cu. m. of gas daily.

During the construction of the plant, 100,000 cu. m. of concrete and 21,000 tonnes of iron will be used. The piping will amount to 44 miles and internal roads to nearly 9½ miles. The plant will use daily 300,000 cu. m. of natural gas, 720 tonnes of steam and 240,000 cu. m. of water for cooling. To ensure an adequate supply of water, the River Canastra will be dammed about 38 miles up-stream from Ferrandina. The utility producing electricity for the plant will generate 30,000 kW. Practically all the raw materials needed will be produced on the spot.

A.N.I.C. are building a plant for the manufacture of synthetic fibres, plastics materials and various derivatives. The cost of the project will be Lire 35,000 million (£20 million) and will consume 600,000 cu. m. of methane daily.

The cost of Ceramica Pozzi's plant has not been revealed, but some indication of its capacity has been disclosed. It will produce 40,000 tonnes of vinyl polymers a year, 30,000 tonnes of methanol, 18,000 tonnes of acetylene and 30,000 tonnes of caustic soda.

The three groups of plants will be supplemented by a network of pipelines which will carry 700,000 cu. m. of gas a

day. The pipelines will be built by S.A.I.P.E.M. and operated by S.N.A.M., both members of the E.N.I. group. Construction has already begun.

The network will consist of three main lines to Matera, Monopoli and Bari. A 44-mile long, 10 in. pipe will go from Ferrandina to Bisetto, a 3-mile long, 12 in. pipe from Bisetto to Bari and a 28-mile, 6 in. pipe from Bisetto to Monopoli. A branch from the Bisetto-Monopoli pipe will go to Matera, a distance of seven miles, and will be constructed in 4-in. pipe. The network will take gas to industries and private homes and will be supplemented by a 27-mile long pipe conveying gas to large plants. The whole network will be ready by the end of 1962.

E.N.I.'s Oil and Natural Gas Output

In 1960 E.N.I. produced 6,168 million cu. m. of natural gas and 673,362 tonnes of hydrocarbons, an increase of 7% and 85% respectively compared with 1959. During the same year, the refineries operated by E.N.I. processed 6.5 million tonnes of crude, an increase of more than 20% on 1959. The refining potential of the group will be expanded considerably when the plants at Gela and the new refinery at Ferrara are completed.

Overseas plants under construction or planned by E.N.I. include those in Morocco (1.25 million tonnes a year), Tunisia (1 million) and Ghana (1.25 million). Two refineries are being built in Southern Germany with capacities of 2 million tonnes.

A.N.I.C.'s plants at Ravenna have now increased their potential capacity of fertilisers to 1 million tonnes and synthetic rubber to 100,000 tonnes a year. The plants of Phillips Carbon Black Italiana and of Societa Chimica Ravenna have been completed. (See also C.A., 27 May, p. 852).

Record Attendance Expected at Superphosphate Meeting

A RECORD number of about 170 delegates from 22 countries is expected by the International Superphosphate Manufacturers' Association to attend the biennial technical conference in Wiesbaden from 11 to 15 September. Twenty-one papers will be presented, dealing with both straight and compound (N-P-K) fertilisers, the production and uses of sulphuric, phosphoric and hydrochloric acids for the fertiliser industry, the recovery of by-products, and various other aspects.

In addition, delegates will be able to exchange views in informal discussion groups on three current topics of interest: the production of liquid fertilisers, the standardisation of methods of fertiliser analysis, and techniques of granulation.

Dr. B. Raistrick, director of Associated Chemical Companies Ltd. and chairman of the I.S.M.A. Technical Committee, will preside over the conference, and the chairmen of sessions will include Mr. J. Dior (France), Mr. S. Hellestam (Sweden), Mr. W. Mak (Netherlands), and Dr. W. Thiessenhusen (Germany), President of the association. Mr. Stevinius-Nielsen (Denmark), is also expected to attend, as is Dr. T. P. Hignett, chief of the Applied Research Branch, Division of Chemical Development, Tennessee Valley Authority.

The Conference should fully reflect the recent expansion in the scope of the association to cover the interests not only of superphosphate producers but also makers of phosphatic fertilisers.

Inquest Follows Death in Carbide Elevator

AT an inquest at Runcorn on 2 August on a maintenance fitter who was killed when he became trapped in working parts of a carbide elevator at the I.C.I. Castner Kellner Works the jury added a rider that the distances between switches on the control panel should be extended, that each switch should be caged and locked and the key should remain in the possession of anyone doing maintenance and inspection work.

Mr. W. R. Cafferata, for I.C.I., said no effort would be spared to find improved methods to prevent such an accident occurring again. Inquiries had already started and the points raised by coroner and jury had been given careful consideration. It was felt that a locking switch offered the best solution. Caging presented certain practical difficulties.

Water Pollution Research Open Days at Stevenage

The Water Pollution Research Laboratory will hold its 'Open Days' on 11 and 12 October to show work on development of methods of treatment of sewage and industrial wastes, and on other aspects of pollution. Applications for invitations should be sent to the director at Elder Way, Stevenage, Herts.

Project News

U.K. Consulting Engineers Get Contract for U.A.R. Projects

LONDON consulting engineers, **L. H. Manderstam and Partners**, are to advise on the design of equipment for, and the implementation of most of the projects included in the second five-year plan for the southern region of the United Arab Republic. Under an agreement ratified on 21 July and now operative, the general organisation for executing the plan entrusts Manderstam with an assignment to advise the Industrial Design Administration on projects which include the superphosphate factory at Assiut, the Kous sugar factory, an extension of the coke oven plant at Helwan, a sardine canning plant at Suez and offsite facilities of the Suez refinery.

Manderstam's responsibilities will include the examination of specifications for plant and equipment to be designed and partly manufactured in the U.A.R., assisting the Industrial Administration with advice on the preparation of specifications for imported equipment, and offers received from abroad, keeping a watching brief on behalf of the Five-Year Industrial Plan Organisation during the period of manufacture of imported plant and equipment, etc.

The agreement also provides for a team of not less than five experts in various branches of engineering, to be delegated by Manderstam for work in conjunction with the Industrial Administration in Cairo. It further provides for a number of visits by Manderstam specialists-engineers to Egypt, in addition to the five resident experts. The resident team of experts will be supported by the technicians in London.

Manderstam's head offices are at 38 Grosvenor Gardens, London, S.W.1.

De Havilland Flowmeters for Indian Oil Pipeline

● **CONTRACT** to supply Pottermeter flowmeters for a new 720-mile pipeline being built in North-East India to carry crude oil from the Assam oilfields to refineries in Gauhati and Barauni (Bihar) has been awarded to **De Havilland Aircraft Co. Ltd.**, a member of the Hawker Siddeley Group. Pottermeter equipment is made in the U.K. by De Havilland under licence from the Potter Aeronautical Corporation, New Jersey, U.S.

Polymer Corporation Shelve U.K. Butyl Project

● **PLANS** of **Polymer Corporation**, Sarnia, Ontario, to build a butyl rubber plant in the U.K. have been abandoned, and alternative European locations for the plant are being explored. According to the company's president, Dr. E. R. Rowzee, "certain problems and difficulties" had caused the company to change

its plans for butyl production in the U.K.

Esso have a 30,000 tons/year butyl rubber project at Fawley. It was stated in 'Distillates,' C.A., 4 Feb., that there was not at present room for more than one butyl plant in the U.K.

Polymer state that no decision has been reached regarding the new location for the plant. Reports from Belgium suggest that Polymer have been negotiating with the Belgian authorities for the construction of a plant in the Zwyndrecht area, near Antwerp.

Apart from the butyl project, Polymer have previously announced plans to produce some 10,000 tonnes of special purpose synthetic rubbers at a plant near Strasbourg, which is expected to be in production by mid-1962.

Electricity Board Demineraliser Contract

● A **CONTRACT** has been awarded to **William Boby & Co.** by the Central Electricity Generating Board for the installation of a fully automatic demineralisation plant at the Bankside power station. It will have a capacity of 8,000 gall. of feedwater per hour.

Sicedison Order Servomex Liquid Analysers

● **THE** Italian firm **Sicedison** have ordered four of the latest infra-red liquid analysers from **Servomex Controls Ltd.**, Crowborough, Sussex. The Servomex chemical instruments manager, C. R. Evans, will be supervising the start-up of these machines at the company's works in Venice.

Servomex report that their export sales are rising very fast, and are expected to reach £70,000 this year, although they are one of the smallest firms in the trade.

S.B.A.-designed Plants for France, Yugoslavia

● **AN** ammonium nitrate plant for France and a synthesis gas plant for Yugoslavia are two projects in which the Société Belge de l'Azote et des Produits Chimiques du Marly (S.B.A.) of Liège, Belgium will be involved. For the French company Ammonia S.A., S.B.A. will engineer a plant for the production of granulated ammonium nitrate, applying the S.B.A. process, which will be incorporated in Ammonia S.A.'s Wingles plant (Pas-de-Calais). Capacity will be 150 tons/day.

The Yugoslav plant, for the firm Proizvodnja Nafta, will be supplied in collaboration with D. Bonaldi and Co., S.p.A., Crema, Italy, with whom S.B.A. have concluded an agreement for this purpose. The plant will produce, from natural gas, synthesis gas for methanol

production. It is designed by the engineering division of S.B.A. and operates the S.B.A.-H.T. process, jointly owned by S.B.A. and the Topsoe Co., Copenhagen.

New Plant, Office Block for International Flavours

● **NEW** production facilities, as well as sales, administration and other offices, are under construction at Enfield, Middlesex, for **International Flavours and Fragrances (Great Britain) Ltd.**, U.K. subsidiary of the U.S. concern. The new plant is located on a fresh site and will be about double the size of the present plant, also at Enfield. Completion is scheduled for mid-1962. The existing Enfield facilities, completed some 23 years ago, have been considerably extended since that time, but continued growth of the market for food products and cosmetics has necessitated the selection of a larger site for the new expansion.

Nitrogen Fertiliser Project for Eire

● A **NITROGENOUS** fertiliser industry is to be established in Eire at Arklow, 60 miles south of Dublin, by a new State-sponsored company. The project will cost between £6 million and £8 million. A local source of pyrites will be used and the power will be provided by fuel oil from the Esso Whitegate refinery at Cork.

In addition to producing nitrogenous fertilisers, the new plant will provide a basis for a number of subsidiary industries based on the by-products.

The consumption of nitrogenous fertilisers in Eire at present is almost 100,000 tons a year.

[Last December plans were announced for a £4 million project to produce 115,000 t.p.a. of sulphuric acid plus superphosphates by Shamrock-Avoca Ltd.—see C.A., 31 December, 1960, p. 1073.]

Third U.K. Lurgi Plant May be Sited in E. Midlands

● It is thought that the U.K.'s third Lurgi plant for the complete gasification of coal is likely to be at one of four East Midlands sites: Desford, Leics; Newstead, Notts; Moor Green, Notts; or Langwith, Derbyshire.

The plant is planned to produce 109 million cu. ft. of gas a day, using 1 million tons of coal a year. By using new techniques the cost is expected to be lower than the estimate two years ago of 8.95d per therm.

Oil Pumps for Stanlow

● **PUMPING** sets for the Shell refinery at Stanlow are to be supplied by **Plenty and Son Ltd.**, Newbury, Berks. The order includes five 260 tons/hr. Universal type pumps with patent constant pressure control mechanism to handle all grades of fuel oils.

Project News

C.J.B. Link with U.S. Firm to Supply Oxygen Plants to Poland

THREE tonnage oxygen and nitrogen plants for Poland are to be designed and supplied by Constructors John Brown Ltd. under a £2 million contract signed with Polimex, the Polish Government trade organisation. The oxygen and nitrogen produced in these plants will be used in the production of ammonia at Tarnow in the south of Poland. C.J.B. engineers will supervise the erection and commissioning of the plant.

The air separation process will be that developed in the U.S. by Hydrocarbon Research Inc., who will be closely associated with C.J.B. in the technical aspects of the project. This process has already been used in the U.S. and elsewhere in a number of plants of similar type—including the largest single tonnage oxygen units in the world—each producing 1,000 tons/day of oxygen. An unusual feature of this contract is, in fact, U.S. participation in a chemical project for a Soviet bloc country.

The plants will be completed within about five years and will have a combined output of nearly 1,000 tons/day of oxygen and more than 1,100 tons/day of nitrogen. For the purpose of ammonia synthesis the nitrogen must be exception-

ally pure and must not contain more than 100 p.p.m. of other gases. The installation will be capable of producing sufficient oxygen and nitrogen for the production of more than 1,000 tons/day of ammonia or several times that quantity of artificial fertilisers, and it will thus make a most important contribution to the development of Polish agriculture.

C.J.B.'s contract—the first contract for the provision of tonnage oxygen plant to an Eastern European country to be secured by a U.K. company—represents a big step forward in U.K. trade with Poland. C.J.B., in conjunction with their associates, have already obtained substantial contracts for work in the U.S.S.R.

The company have been engaged for some time in negotiating this contract, which has been finally signed in Warsaw after a month of intensive discussion on the technical and commercial details. Signatories were Mr. Kozuba, director of Polimex, and Mr. Niedzielski, an executive, and for C.J.B., Mr. F. P. Korn, commercial manager, and Mr. A. M. Clark, technical executive responsible. The payment terms are part in cash and the remainder on credit. C.J.B. were required to give exacting

guarantees on plant delivery and performance.

C.J.B. reveal that the contract was won in the face of strong competition from well established suppliers in both the U.K. and Western Europe, whose position in this field has hitherto been unchallenged. The company add that this contract "may well inaugurate a new phase in the provision of tonnage oxygen and nitrogen plants for the steel and chemical industries of the rapidly developing countries in Eastern Europe, and throughout the world".

Equipment for Esso Butyl Plant

● An order worth £6,000 for mild steel and Monel trays has been placed by Foster Wheeler with the Liverpool company, Andrews Bros. (Bristol). The trays are for use in Esso's 30,000 tons/year synthetic rubber plant now under construction at Fawley.

Translation of Soviet Plastics Journal

A NEW cover-to-cover translation of a Soviet plastics journal, *Plasticheskie Massy*, is now available. *Soviet Plastics* is published under a scheme sponsored by the Department of Scientific and Industrial Research for translations of important Russian journals. The translation is prepared by the Rubber and Plastics Research Association of Great Britain and the journal is published by Rubber and Technical Press Ltd., Gaywood House, Great Peter Street, London, S.W.1, to whom orders should be addressed.

Soviet Plastics contains articles on the chemistry of plastics, production methods and machinery, the testing of raw materials and finished products, and factory practice. The journal is published monthly and costs £14 for 12 issues.

Davy-Ashmore Acquire Aircraft for Export Promotion Executives

LATEST U.K. company to acquire its own aircraft to cut travelling time by export-promoting executives is Davy-Ashmore Ltd., the engineering firm. In a recent ceremony, a Beechcraft Queen Air low-wing twin-engined monoplane was handed over to Mr. M. A. Fiennes, group managing director of Davy-Ashmore, by Mr. D. Keith-Lucas, technical director of Short Brothers and Harland Ltd.

Intensification of the Group's selling efforts in export markets has led to greatly increased travelling abroad, and it is felt that the aircraft will be invaluable in maintaining closer contact be-

tween the Group's manufacturing centres in the United Kingdom and its branches and customers overseas. It will effect considerable savings in valuable travelling time, make it easier for urgent journeys to be arranged at short notice and allow far more flexible itineraries to be planned.

The Beechcraft Queen Air can carry six people and their baggage over 1,000 miles non-stop in a little more than 5 hr. With a maximum speed in level flight of 239 m.p.h., it is fully instrumented for all-weather operation. The roomy interior with its adequate soundproofing, work tables and quickly adjustable seating, literally create "an office in the sky."



Davy-Ashmore Beechcraft Queen Aircraft

Packaging Directory

Containing 305 pages of text—an increase of 81 pages over the 1960 edition, the 'Packaging Directory, 1961', published by the Tudor Press Ltd., 75 Carter Lane, London E.C.4, contains seven main divisions and covers a variety of different packaging materials, types of containers and packaging machinery and their suppliers. Official organisations connected with packaging are also listed, as are foreign firms with foreign agents. A directory of trade names is a further feature.

Price of the directory is 21s post free.

Construction Workers' Strike at Carrington Ends

The five-week-old strike of construction workers at the Carrington plant of Shell has ended. The men decided to return to work after they were told by their union leaders that their claim for a shilling an hour wage increase was "ambitious."

COAL TAR PRODUCTS FOR BURIED PIPES

Impermeability to Moisture and Resistance to Bacteria

THE pattern of disposal of the 1.5 million tons of coal tar distillation residues in the U.K. has always differed from that of the other major producing countries. During the last few years, however, considerable effort has been applied to the development of pitch fibre pipes and coal tar based pipeline enamels similar to those produced abroad, particularly in the U.S. Because of the almost complete impermeability of coal tar pitch to moisture and moisture vapour, coupled with its resistance to bacterial and fungal attack, it is a highly desirable material for this purpose. The low mechanical strength and sensitivity of flow properties to temperature change of unmodified coal tar pitch are disadvantages, however, which make correct formulation and application of great importance.

Pitch Fibre Pipes. Pitch impregnated pipes were first used in Germany for gas supply more than a century ago, but large scale commercial development began only in 1890. Since that date production has steadily increased in the U.S., the growth being most spectacular in the last 20 years. Since 1945 it has increased at least sixfold. In the U.K. pitch fibre pipes were not marketed until 1953, but since then progress has been steady. The yearly output had risen to 12 million feet in 1959, but this was only 1/25 of the figure for the U.S. for the same year. A number of factories in the Home Counties area have been responsible for this production, but earlier this year a new factory at Ellesmere Port was in operation. The main use has been for drainage and sewerage, but pitch fibre pipes have also been used extensively for cable conduits.

Reduced Costs

Apart from their excellent resistance to soil moisture, acid and alkaline, and to microbiological attack these pipes have the virtue of resilience and ability to withstand soil movement. Concrete support is unnecessary and even undesirable, and thus the cost of laying is greatly reduced. Other features are smoothness, which permits drainage at lower gradients, and the ease of making water tight joints. There has been a British Standard for pitch impregnated fibre drain and sewer pipes since 1956. Six sizes of pipe are described with internal diameter ranging from 2 in. to 8 in. The Standard ensures the suitability of mechanical properties as well as thermal stability and chemical resistance. It includes heat resistance and boiling water tests.

Wood-cellulose fibre is used for the reinforcing structure and is obtained as mill offcuts or waste newsprint. This is

made into 'white tubes' which are passed through drying ovens. The tubes are then placed upright in basket containers and lowered into a vacuum impregnation unit. After evacuation, the hot liquid pitch, prepared from carefully selected coal tar to a suitable viscosity, is admitted and forced into the body of the pipes under slight pressure. The pipe containers are withdrawn and transferred to cold water quenching tanks.

By

L. J. Wood, F.R.I.C.

Coal Tar Research
Association

- Pattern of coal tar residue consumption in U.K. differs from other countries.
- Increase in use of pitch fibre pipes in U.K.
- Resistance of coal tar based enamels to corrosion.

Finally the ends of the pipes are machined to provide for fitting to each other or to the special bend, junction or other fittings used. The finished pipe contains about 75 % of pitch.

Pipeline Enamels.—The liability of steel pipes to rapid corrosion necessitates a high standard of protective coating for pipes to be buried underground. The superior qualities of coal tar based enamels for this purpose have been appreciated in the U.S. for decades. This is illustrated by the statistics which are available for the period 1950-5: 10,426 miles of pipelines, representing 76% of the total were protected with coal tar enamels. Similar materials have been used on a large scale in Germany, but until fairly recently only one British firm was marketing them. In the last few years a second British firm has supplied thousands of tons for many projects including petroleum pipelines in the Middle and Far East. Interest in the production and utilisation of these enamels is still increasing in this country and it is probable that their use in the protection of gas service pipes will be extended considerably.

There is as yet no British Standard for coal tar enamels but they are generally supplied to meet the very stringent requirements of the American Water

Works Association tests. These ensure that the enamel used with its primer will form a bond to the pipe so strong that peeling is impossible, and that the enamel possesses mechanical rigidity over the temperature range -20 to 160°F, as well as passing bending and impact tests.

In adapting coal tar pitch to pass these tests it is necessary to reduce the temperature susceptibility and to reinforce the composition with filler. The required large temperature interval between softening and brittleness is attained by dispersing powdered coal at a temperature of over 300°C. The temperature susceptibility of the coal tar pitch is readily reduced in this way to match that of oxidised bitumen.

In order to obtain the requisite adhesion between the enamel and the pipe a cold-applied primer is used. The formulation of suitable primers has provided development chemists in this field with most of their headaches. The primer generally contains a coal dispersion pitch and volatile coal tar solvent. It has been found by the Coal Tar Research Association that inclusion of 5% naphthalene in the pitch leads to improved adhesion.

Coating Pipes

Coating of the pipes may be carried out either in the factory or on site. Enamel of A.W.W.A. grade must be heated to over 200°C and good fume extraction is essential in confined situations. A coat of enamel is applied by flooding the primed pipe while it is rotated and moved along under the fixed head supplying the enamel. Alternatively a line travelling machine may move along the pipe which is then simply rotated. In either case one, or more generally two layers of glass fibre wrapping are simultaneously applied to strengthen the finished coating and to ensure evenness.

Another development in the past few years in the U.S. has been that of coal tar-epoxy resin coatings. Epoxy resins are very expensive for this application, but their toughness enables the use of thinner coatings and glass fibre wrappings do not appear to be necessary. The recommended thickness for tar-epoxy coatings is 15 to 30 thousandths of an in. compared with a typical thickness of 3/32 in. for a coal tar pitch enamel. Other attractions of the tar-epoxy systems are excellent adhesion and their use at lower viscosities with curing agents that enable them to be cold-applied. In practice it will probably be preferable to use heat to shorten the curing time, but as curing takes only a few minutes at temperatures over 100°C the high temperatures needed for the conventional pitch enamels with their attendant fuming problems will not arise. Experience with the tar-epoxy coatings is still much too recent for their service life to be assessed.



★ Two U.S. oil giants who are currently moving deeper into petrochemicals—Gulf Oil and Socony Mobil—are in the news this week. Gulf Oil follow up announcement of their plans for setting up petrochemical facilities in Sardinia (C.A., 29 July, p. 166) with a statement that they have plans for an ethylene plant near Houston, Texas, with capacity of more than 400 million lb./year, plus high-purity propylene and other chemicals.

Construction will start late in 1961 with completion due by the middle of 1963. Gulf Oil will also leave part of their large site to potential users of their chemicals.

Socony Mobil's subsidiary, Mobil Chemical, have started up at Beaumont what is currently claimed to be the world's largest capacity ethylene plant (380 million lb./year). Other products are 200 million lb./year of propylene and 45 million lb./year of butadiene, plus propane, butylenes, pyrolysis gasoline and 30 million gall. benzene by the Udex process. Nearby Mobil customers will include Houston Chemical (TEL, TML, ethylene oxide and glycol); Foster Grant (low-density polythene); Goodyear (polybutadiene, isoprene and polyisoprene rubbers).

Next year Mobil will lose their title as leading ethylene producers to Monsanto Chemical, whose 500 million lb./year plant will then be on stream at Chocolate Bayou, Tex.

★ "That's the wise thrush: he sings each song twice over," said the poet in a eulogy on the glories of the English springtime. But it must have been due more to the soporific effect of the English summer that *CHEMICAL AGE* last week published on two separate pages (199 and 200) the same brief report on National Starch and Chemical's vinyl acetate monomer project in Texas.

The items, of course, came from two different sources and it is some compensation that, despite the different wording, the coincidence of the facts presented confirms their reliability.

★ WHEN Lord Robens first disclosed the National Coal Board's plans to mount experiments for the injection of milled coal into blast furnaces as being a technique quite new to the U.K. (C.A., 22 July, p. 132), he was not strictly correct. This process was tried out in Britain some 30 years ago; those early experiments failed because it was not appreciated that temperature had to be raised.

U.S. practice has shown that for practical purposes, blast furnace temperature

has to be boosted 100°C for every 10% of fuel injected up to a maximum of around 30%. Injection of milled coal at the bottom of the furnace can lead therefore to a 30% saving in coke.

The N.C.B. experiments are to be carried out at one of the normal blast furnaces of Stanton Ironworks with injection equipment designed by Petrocarb Inc., the U.S. firm that recently pioneered the full-scale application of the technique in America. Stanton will use some 500 tons of milled coal a week, but do not expect to be able to push temperatures up by more than 150°-200°C.

★ THAT well-known and so-little-loved Cheshire landmark, the Runcorn transporter bridge, has finally had its day. With the recent opening of the high level road bridge between Widnes and Runcorn, chemical firms in the area are now offering speedier deliveries to customers.

A spokesman for I.C.I. tells me that the new bridge has meant considerable savings in both time and mileage for the company's road transport vehicles. With works on both sides of the Mersey, vehicles are now able to cross from Widnes, to Runcorn in five or 10 minutes instead of having to make a detour through Warrington.

Albright and Wilson tell me that the bridge has had a profound influence on the Widnes factories of A. Boake Roberts and Co., W. J. Bush and Albright and Wilson (Mfg.), because it has led to much faster deliveries of chemicals both to and from the works.

★ MODERN big-brother successor to the goatskin bag for transporting water in the Sahara desert is an inflatable tank of synthetic rubber and nylon which can be carried on the platform of a van-type truck and, when emptied, can be rolled up into a small pack. Information from Du Pont (United Kingdom) Ltd. indicates that such tanks are solving the water supply problems of companies operating in the Sahara, being designed to keep drinking or industrial water fresh, cool, and 100% hygienic over long periods in the hottest temperatures. Storage of petrol, fuel oils and liquid chemicals are a further application.

The tank walls are about 2 mm. thick and consist of three layers of neoprene bonded alternately on to two layers of nylon. A coating of aluminium pigmented Hypalon synthetic rubber paint sprayed on the surface prevents the accumulation of static electricity and guards against heat penetration. Quick filling and draining of the tanks is made

possible by two valves with firehose-type connections.

★ EFFICIENT recovery of germanium from waste is essential because of the very high cost of the metal. News of the perfecting of a technique developed by the General Electric Co. for its recovery from waste materials obtained during chemical etching or physical machining processes will, therefore, be welcome. With the cost of germanium at 2s 6d/gramme, the 80% recovery claimed for the process constitutes a considerable saving.

The process consists of the formation of germanium tetrachloride (GeCl_4) from the germanium in the waste material. There are several ways of doing this depending on the type of waste. The method for treating an alkaline waste, for instance, in which alkali germanates such as Na_2GeO_3 will be present, is the addition of a strong inorganic acid followed by an excess of ammonia to precipitate the solid.

Pure germanium tetrachloride is obtained by dissolving the precipitate in hydrochloric acid and subjecting to fractional distillation. The chloride on hydrolysis gives the oxide which is readily reduced to the metal by hydrogen.

★ YACHTING readers of mine will doubtless have read of the fantastic successes last week of 'Bristol I' in the *Yachting World* Keelboat class. Having beaten 270 contestants in the Round-the-Island race at Cowes—and on her first race—'Bristol I' went on to notch up four wins during Cowes Week. I wonder how many readers appreciated that she is a plastics version of the Keelboat.

It was developed at Filton by Bristol Aeroplane Plastics Ltd. The mould-tool for the plastics hull was made from glass-cloth and Cellobond polyester resin. With hog and beams of the boat's hull in mahogany, 'Bristol I' has closely spaced ribs fore and aft in polystyrene buoyant foam. These are wrapped in glass cloth and bonded to the skin, which is formed by an application of gel coat and laminations of glass-fibre mat, woven glass cloth and glass-cloth tissue. Each lamination is bonded with weight-controlled applications of colour impregnated polyester resin.

When I sat in 'Bristol I's' cockpit last week, I felt it should have been rechristened 'Distillers I'. Apart from their Cellobond, she was tied up alongside the schooner 'Garland', chartered by D.C.L. Plastics Group for Cowes Week, with Rigidex ropes and protected with expanded p.v.c. fenders. Of novel design, I noticed that these were made in Norway, but from p.v.c. imported from British Geon of the Distillers Plastics Group. To round up the plastics at Cowes picture, I saw the first pram dinghy to be made from rigid Geon p.v.c.—like the somewhat sleeker 'Bristol I', this should be a 'winner'.

Alembic

Cutting Handling Costs

Fine Chemical Makers Increase Efficiency After Reorganisation

DURING the last 10 years Ansul Chemical Co., Marinette, Wis., claimed to be the world's largest manufacturers of dry chemical fire-extinguishing equipment, and to have a large business in air-conditioning refrigerants and industrial chemicals, have reorganised their production methods, with a view to cutting costs while turning out equipment of the highest possible quality. The studies in this connection have resulted in a complete change in the views on plant operation which were previously held.

Initially the handling system favoured was a pneumatic one, as it was considered that such a method of connecting the dry-chemical and fire-extinguisher manufacturing plants would simplify manufacture. On investigation this idea was ruled out on the grounds of high initial cost and rigidity. Whatever system was selected had to satisfy the requirement of a handling system involving the minimum of operation, it had to be able to cater for 2,000 lb. loads of dry chemicals, handle the fire-extinguisher plants unit-filling procedures, and at the same time be free from dust.

Automatic Weighing Control Installed

The first alteration decided upon was the installation of automatic weighing control. This immediately produced worthwhile economies, for with hand-filling two to three pounds overweight was common in the filling of the 20 to 30 lb. extinguishers, and the corresponding 10% excess extended to the smaller types. As soon as these substantial economies had been made, attention was turned to materials handling and the Tote system's possibilities were investigated.

This system is centred round hermetically sealed aluminium bins of varying sizes; the one ultimately selected as being best suited to Ansul Chemical's needs was the 74 cu. ft. size. A trial installation was put in for the handling of up to 2,300 lb. loads of a sodium bicarbonate-based dry chemical. This was received directly from the blending operation, stored, and when required discharged into the pre-set automatic filling hoppers. The results were very satisfactory and an additional benefit was obtained in that the hygroscopic chemicals were kept hermetically sealed. On the basis of these tests it was decided to make a complete installation.

Twelve aluminium bins were obtained, and a Tote tilt. The latter is a discharge mechanism, which is essentially a platform upon which the bin is placed prior to being tipped through 45 degrees to

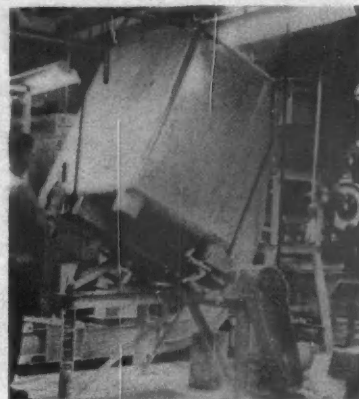
enable the contents to flow out. The bins were put to use receiving chemicals at the dry-chemical plant. After being filled directly from the blender, the bins are either stored at that plant or immediately taken by fork-lift truck to the fire-extinguisher plant. There the bins are tied to save space and discharged directly, when required, into the packaging line.

Since the installation of the plant, two extensions have been made to the equipment, including an additional tilt. The system readily lends itself to expansion, is adaptable to any material, and may be easily transported wherever it may be required. It now handles 16½ short tons of powdered material a week, with a bulk density ranging from 62 to 68 lb. per cu. ft. and median particle size of 28 to 35 microns.

Dust Eliminated

Before the introduction of the Tote system the highly dusty chemical was filled into bags at the dry-chemicals plant and hand-introduced into the hoppers at the extinguisher fabrication line, via a bucket elevator. This procedure was such a dusty one that a specially vented closed room was erected for the operation of manually emptying the bags. With the Tote system this room is no longer needed, apart from the fact that the conditions are far less onerous. Nor is output restricted, as was sometimes the case when one man at the filling point and one at the discharge point were unable to keep pace with the requirements. With the new system increase in production and the manufacture of new products has proved possible without any additions being necessary to the personnel.

So far from increasing personnel, the company conservatively estimates its saving, as the result of installing the Tote system, as half a man, but this saving cannot be defined accurately because of expanded activities. Ample supplies of chemicals are now assured, longer production runs are possible, and storage is simplified. Usually material is turned over within 48 hours. Filling,



Tilted bin discharging into bucket elevator, visible near floor level. The elevator takes the fire-extinguishing chemicals to an automatic-weighing filler hopper, which directs predetermined amounts to the extinguisher packing line

previously as much as two to three pounds overweight per large extinguisher, is now accurate within ounces. Spilling and dust problems are virtually eliminated and quality control is easily maintained.

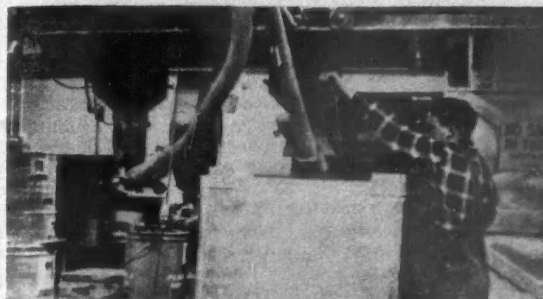
The Tote system of materials handling is available in Britain from Pressoturn Ltd., Leamington Spa, Warwickshire.

Strong New Ceramic Developed in U.S.

A NEW ceramic material developed by research scientists of Honeywell, U.S., the American associates of Honeywell Controls Ltd., London, is described as combining great purity and density and has the unusually high melting point of 2,800°C. Applications could include heat-exchange medium in wind-tunnel pebble-bed heaters, or for electrical insulation at high temperature.

The material is a translucent magnesium oxide and according to Dr. Finn J. Larsen, who is in charge of Honeywell research, comes within 2% of the maximum density possible. In addition to the greater strength possessed by the new material, its high density makes possible better finishes, it is said.

When chemically polished the magnesium oxide has a strength of 45,000 p.s.i. compared with 24,000 p.s.i. for ordinary magnesium oxide.



Filling a Tote bin directly from the batch blender on the floor above

Fisons Entertain Soviet Officials



Chairman of the U.S.S.R. State Committee for Cultural Relations with Foreign Countries, Vsevolod Sofinski, and Radio Moscow's Head of Broadcasting to Great Britain, Rudolf Kurkin, were entertained at the Savoy by Fisons Ltd. last week. The two Russians were in London for the Soviet Exhibition at Earls Court, and were responsible for handling public relations for Major Gagarin's visit. Photo shows (l. to r.): Alan Caine, Mike Skinner, Dick Owen, Vsevolod Sofinski, Jack Lassman, Rudolf Kurkin, Richard Bing, Eric Sawyer. The dinner was given as a 'thank you' for the help given by the Committee and Radio Moscow to Fisons' staff on their visit to Moscow both before and during the British Trade Fair

Pressure Recycling System is Key to New Canadian TiO_2 -from-Ilmenite Process

THE process to be used in the new 20 tons/day titanium dioxide plant now under construction for Continental Titanium Corporation of Montreal at Baie St. Paul, Quebec, shows promise of providing a new, economical method of producing titanium dioxide from ilmenite, making it possible to use leaner ores than in the conventional process, with reduced acid requirements as an additional advantage.

Departing from the usual batch system, the process uses a continuous recycling technique in which ores and sulphuric acid solutions are recycled in steam-jacketed pipes under pressure. In the first stage, ilmenite ore is fed in with dilute sulphuric acid, the ore-acid mixture being partially dissolved at about 490° F and 300 p.s.i. as sulphur dioxide is introduced to convert the ferric iron to ferrous. Treatment of the slurry in thickeners and hydrocyclones gives a concentrate low in iron (5% ferric oxide) and high in titanium dioxide (over 80%).

Dissolution is completed in a further stage, and is followed by hydrolysis, in which the solution is injected directly into a circulating volume of solution that has already been partially hydrolysed, thus providing a means of controlling the too rapid initial reaction which results in an unsatisfactory product. Following hydrolysis, the solution meets with a hydrolysed mixture circulating at about 140° F; this cools it quickly and, under close control, yields the preferred crystal size. Filtering, drying and finishing steps are similar to the conventional process.

The new process, called the Soloducha

process after its inventor, Continental Titanium's vice-president, was described in *Chemical Week*, 22 July, where it was reported that a 30,000 tons/year plant would cost \$10 million, or about \$330 per annual ton of capacity. The costs for Continental Titanium's current project, rated at 6,600 tons/year, is put in the region of \$400/annual ton. It is expected that, if the Baie St. Paul plant comes up to expectations, and if Continental Titanium decide to license out the process, the process will find favour for future titanium dioxide facilities projected by U.S. producers.

Effect of Advertising on N.H.S. Costs

CONCERN at the possibility of extravagant advertising in the pharmaceutical industry may be inflating the prices paid by the National Health Service is expressed in the third annual report of the Committee of Public Accounts (The Third Report from the Committee of Public Accounts, Session 1960-61, H.M.S.O., 2s.).

Expenditure on advertising through the mail and on free samples was 4.31% of total net sales of £50 million a year. The Minister of Health has no information on the cost of sales promotion by door to door representatives and the Committee recommends that this information should be made available.

The pharmaceutical industry has now adopted a code of advertising which was thought to have eliminated the worst abuses.

Liverpool Firm Has Two Fires in Eight Days

FOR the second time in eight days, firemen were called to the works of Sanders Products (Liverpool) Ltd., oils and chemical manufacturers, Brecon Street, Liverpool 6. On the first occasion the fire was discovered by a local cinema manager and the fire was extinguished before serious damage could be caused at the rear of the factory.

The second outbreak, on 4 August, occurred at the front of the two-storey building. When Liverpool fire service arrived the upper floor was blazing furiously and firemen had to use axes to break through the roof to play jets on the fire. The fire was out in less than an hour but the roof and ground floor ceiling caved in. Liverpool C.I.D. are investigating.

Another Journal Joins Benn Group

FOLLOWING announcement last week of the acquisition of *Printing News*, another journal—*Education Equipment*, purchased from H. F. Maynard Ltd.—has joined the Benn Brothers' group of publications. *Education Equipment*, which is a controlled circulation monthly with a distribution of 10,200 copies, covers information of new equipment, services and supplies for education.

Address of both journals under their new management will be Bouverie House, 154 Fleet Street, London, E.C.4. (Fleet Street 3212.)

Novel Polymer Techniques as Symposium Subject

PAPERS concerned with novel techniques in polymer synthesis; analysis, including structural analysis; and the measurement of physical properties, will be featured in a symposium entitled 'Techniques of polymer science' to be held in London on 27 and 28 September 1962.

The symposium is being organised by the Plastics and Polymer Group, Society of Chemical Industry and summaries of proposed contributions should be sent to the convener of the symposium sub-committee at 14 Belgrave Square, London S.W.1, before 1 December 1961. Complete typescripts of papers provisionally accepted will be called for by 1 June 1962.

£8.5 Million for I.C.I. Workers

A BONUS of £8,555,000, a record figure, will be paid by Imperial Chemical Industries Ltd. to 92,000 of their employees under their profit sharing scheme. The average bonus per employee for 1960 amounts to £92 17s 10d. This is an increase on the previous year when 93,229 employees shared £7,305,956.

The net bonus has been paid to the trustees of the scheme who will use it to acquire £1,883,000 I.C.I. ordinary stock on behalf of the employees.

Sulphuric Acid Output Up in First Half 1961

PRODUCTION of sulphuric acid in the first half of 1961 totalled 1,346,823 tons compared with 1,336,894 tons in the first half of last year. U.K. consumption of acid during January to June amounted to 1,367,649 tons, compared with a first-half 1960 figure of 1,373,782 tons.

Second quarter 1961 production, according to the National Sulphuric Acid Association, totalled 664,915 tons, compared with 654,211 tons in the second quarter of 1960, while consumption during April-June 1961 amounted to 676,793 tons, a slight increase on the 1960 figure of 673,589.

The following summaries of monthly returns do not include Government plants.

SULPHURIC ACID AND OLEUM

(100% H₂SO₄ new acid)

	Tons	Contact	Chamber & tower	Total
Stock 1.4.61	...	76,722	21,690	98,412
Production	...	567,767	97,148	664,915
Stock 30.6.61	...	644,489	118,838	763,327
Apparent use	...	76,634	21,941	98,575
Total capacity represented (cons/quarter)	657,230	135,720	792,950	
Capacity in use—%	86.4	71.6	83.9	

U.K. CONSUMPTION OF ACID AND OLEUM

(To 100% H₂SO₄)

Trade Uses	1st April to 30th June 1960	(1961)
Acids—organics & misc.	...	10,194
Accumulators	3,497	3,231
Agricultural purposes	689	499
Bromine	5,407	6,896
Clays (fuller's earth, etc.)	3,034	3,432
Copper pickling	584	688
Dealers	3,327	3,138
Dichromate & chromic acid	5,657	6,763
Drugs & fine chemicals	5,145	5,680
Dyestuffs & intermediates	27,351	25,395
Explosives	2,870	2,291
Export	881	1,062
Glue, gelatine & size	128	121
Hydrochloric acid	12,106	13,240
Hydrofluoric acid	3,213	3,933
Iron pickling (inc. tin plate)	34,880	30,624
Leather	947	884
Lithopone	4,195	3,699
Metal extraction	668	707
Oil refining & petroleum products	20,381	18,148
Oils (vegetable)	2,212	2,560
Paper, etc.	2,243	2,720
Phosphates (industrial)	1,144	577
Plastics, n.o.c.	15,561	16,235
Rayon & transparent paper	67,022	56,799
Sewage	3,427	3,396
Sosp., glycerine & detergents	32,447	31,599
Sugar refining	115	106
Sulphate of ammonia	71,217	71,523
Sulphates of copper, nickel, etc.	8,013	6,238
Sulphate of magnesium	43	24
Superphosphates & other phosphatic fertilisers	148,630	170,650
Tar & benzole	5,898	5,075
Textile uses	4,164	4,503
Titanium dioxide	115,778	115,859
Unclassified	66,695	48,296
Total	673,589	676,793

RAW MATERIALS

(Tons of Material)

	Sulphur	Recovered, H ₂ S & filter cake	Pyrites	Spent oxide	Anhydrite	Zinc concentrates
Stock 1.4.61	66,193	4,703	130,797	69,431	13,161	53,254
Receipts	105,422	16,064	83,445	63,558	191,356	56,080
Use	96,347	17,180	82,323	57,800	191,837	46,803
Adjustments†	3,320	282	3,664	3,417	—	348
Stock 30.6.61	71,948	3,305	128,255	71,772	12,680	62,879
Acid made from above Raw Materials Tons 100% H ₂ SO ₄ (Total 664,900 tons)	281,400	48,400	107,100	76,900	114,900	36,200
Per cent of Total	42.3	7.3	16.1	11.6	17.3	5.4

† Overall effect of stock adjustments, transfers and uses for purposes other than sulphuric acid manufacture.

SHAWINIGAN TO MAKE OLEFINS AT NEW QUEBEC SITE, BUY B.A. CUMENE-PHENOL INTEREST

PRELIMINARY work will start shortly on construction of a \$20-million petrochemical plant by Shawinigan Chemicals Ltd., and an associated \$45 million 300,000 kW thermal electric station by the Shawinigan Water and Power Co. on the south shore of the St. Lawrence River not far from Montreal.

The petrochemical plant will be located at Varennes, Que., close to the present plant of Shawinigan Chemicals' St. Maurice Division. It is expected to go into operation in mid-1963.

British American Oil Co. will provide raw materials for the new plant as well as heavy fuel oil for the power station. Initially processing of crude oil will be carried out at British American's Montreal East refinery, but plans have been made for future construction of an oil distillation unit at Varennes.

British American Oil will participate in financing the petrochemical project by subscribing for shares of Shawinigan Chemicals, and will transfer to Shawinigan Chemicals their present 50% interest in B.A. Shawinigan Ltd., cumene phenol producers. B.A.-Shawinigan will then become wholly owned and a division of the Shawinigan Chemicals, who already have a 50% stake in this company. The number of shares of Shawinigan Chemicals to be owned by B.A. Oil will represent 25% of the resulting share capital of Shawinigan Chemicals.

Integration of the petrochemical project with the thermal power station offers advantages to groups, since economic success of the petrochemical plant largely depends on ability to dispose of the residual fuel oil produced in the producing of the crude oil.

Products of the petrochemical plant will be ethylene, propylene and other products "which are basic building blocks of the chemical industry". The ethylene will be used primarily for the production of acetaldehyde which will be shipped to Shawinigan as an alternative source of supply of this intermediate which is currently being produced from acetylene. Other intermediates may ultimately also be used at Shawinigan for the expansion of operations there.

British American Oil, who will continue to supply cumene to the B.A.-Shawinigan plant, are expanding their

interests in petrochemicals. A benzene unit was recently completed at Montreal East refinery to make the company even more self-sufficient in the production of cumene. B.A. are also to set up Canada's first plant to make cyclohexane. Currently imported into Canada, cyclohexane is used by one major consumer, Du Pont of Canada, in the production of nylon intermediates at Maitland, Ont.

Effluent Exhibition Will Be Much Bigger

THE second Effluent and Water Treatment Exhibition and Convention at the Seymour Hall, London, from 31 October until 3 November will be nearly twice the size of the one held in 1960. There will be a number of developments and innovations on show at the exhibition.

Increasingly severe restrictions are being imposed by River Authorities on the type of effluent discharged. The growing volume of water required for industry cannot always be provided economically from available sources and recovery of used water is of prime importance. Both the subjects will be well represented at the exhibition by new designs and techniques.

At the convention a paper is to be presented by a leading Soviet water treatment scientist, Oleg Lenchevsky, who recently sought political asylum in the U.K.

Registrations for the Convention have been accepted from French, Belgian, German, American, Italian as well as U.K. delegates. Registration is £4 per delegate and forms are obtainable from the organisers: Thunderbird Enterprises Ltd., 140 Cromwell Road, London S.W.7.

Big Increases in Students Taking Dip.Tech. Courses

AT 31 March there was a total of 4,960 students taking courses in the newly founded Diploma of Technology, compared with 3,814 a year previously, according to the annual report of the National Council for Technological Awards. A total of 512 students took Dip.Tech courses in applied chemistry, chemical technology and industrial technology, compared with 359; 162 (112) were taking courses in chemical engineering and 26 (14) were studying applied biochemistry and applied pharmacology.

As at 31 March, a total of 34 students had gained diplomas in applied chemistry and 6 in chemical technology. Diplomas were awarded as follows: Applied chemistry, Battersea College of Technology 3, Birmingham College of Advanced Technology 12, Brunel College of Technology 11; chemical technology, Birmingham College of Advanced Technology 6.

Radiocarbon Analysis Helps Differentiate Between Synthetic and Natural Caffeine

DEMAND for caffeine as a result of its wide and varied use in a large number of products against a shrinking supply from natural sources such as coffee, tea and coca has caused producers to turn to synthetic material.

Until recently, however, there has been no known method of analysis to differentiate synthetic from natural, vegetable caffeine. In 1955, Albert B. Allen, Coca-Cola Export Corporation, Atlanta, proposed the use of C^{14} radiocarbon analysis for making this differentiation, since some of the steps in commercial synthesis indicated that the materials used (i.e. urea, dimethylurea and chloroacetic acid) would probably be derived in part if not entirely from petroleum and coal products, where a radioactivity of C^{14} had for all practical purposes become extinct.

Synthetic samples of caffeine from

producers in the U.S. and Europe have been analysed by radiocarbon counting, based on oxidation of the sample to carbon dioxide, purification of the carbon dioxide and subsequent radiocarbon counting of carbon dioxide with a proportional counter.

Caffeine sold commercially has been successfully analysed by radiocarbon analyses for identification as to its synthetic or natural origin. Samples from German synthetic producers have shown that both sources used carbon which is radioactively extinct. In the U.S., two sources used one modern carbon atom in the synthetic process. In the U.K., the producer appears to have used two modern carbon atoms. The method is, of course, not restricted to caffeine, but may be applied to any natural/synthetic pair in which the synthetic one is made from dead carbon.

New Drugs from Tropical Plants

POTENTIALLY valuable new sources of drugs—tropical plants—are being examined by the Tropical Products Institute of the Department of Scientific and Industrial Research (Report of the T.P.I., 1960, H.M.S.O., 3s).

Already 314 plants have been tested, including specimens from Borneo as well as others from Kew Gardens. A number of alkaloid-containing plants have been found and are being subjected to further tests. Other plants from the tropics are being studied by request or because they seemed particularly promising for this type of work.

There is an expansion in the long-term research work of the Institute to meet the needs of the rapidly developing tropical countries. This reflects a trend away from the short-term inquiries of, for example, a routine analytical nature, in order to help newly established laboratories overseas with their research and development problems. Even more important is the demand for qualified manpower in the territories themselves and the Institute has helped in sending visiting scientists to overseas territories and by training research workers from tropical countries.

Explosive Dusts Tested at Fire Research Station

New light on dust explosion in industry has emerged from tests on 41 samples of dust which have been carried out at the Fire Research Station and at the Safety in Mines Research Establishment, Buxton. These samples have been analysed and classified according to their ease of ignition and it appears that those in the most danger class include azodiisobutyronitrile, azo-dicarbonamide, benzene sulphonyl hydrazide, polymerised methyl methacrylate, a mixture of cotton fibres and mineral dusts, novobioicin, crushed nut shell, citric acid, aluminium powders, dried yeast, a bronze powder, gilsonite dust, a fertiliser mixture, zinc, leather dust, dried spent grass meal and nigrosine hydrochloride.

Further details of these tests are given in the annual report of the Joint Fire Research Organization ('Fire Research 1960', published for D.S.I.R. by H.M.S.O., 5s 6d), which also notes that

research has been concentrated on providing relief for venting systems so that if an explosion does occur, flames or hot gases can be ejected safely.

Salon de la Chimie in Paris

Preliminary details have been issued for the Conference Internationale des Arts Chimiques, which will be held in Paris 25 April-4 May 1962. Associated with the conference is the 6th Salon International de la Chimie, which on this occasion moves to a larger setting at the Centre National des Industries et des Techniques, Place de la Défense, Puteaux, Paris.

Details of the programme are available from the Commissariat-General, Salon International de la Chimie, 28 rue Saint-Dominique, Paris 7.

Link Between European and U.S. Technology

A MAJOR purpose of a new corporation recently set up in the U.S. is to provide liaison between European and U.S. technology. The new enterprise, providing research, technical information, investment advice and management services in the U.S. and Europe, is being organised by Dr. Clyde Williams, Columbus, Ohio. To be incorporated in Ohio, the firm will be known as the Clyde Williams Corp. Its main offices will be at 50 West Gay Street, Columbus, and branch offices will be maintained in London and Paris.

In launching the new enterprise, Dr. Williams said that although tremendous progress is being made in research and technology on both sides of the Atlantic, there are inadequate mechanisms for communications and integration of technological developments at a businessman's level.

Stanton Balances for French Measures Bureau

A HIGH precision balance of 10 kg. capacity has been supplied and installed at the Bureau International des Poids et Mesures, Sevres, near Paris, by Stanton Instruments Ltd., 119 Oxford Street, London W.1. The Bureau, which is the world's standards laboratory for those countries which adhere to the International Metric Convention, is re-equipping its mass section during the next few years. The 10 kg. balance is the first new high precision balance to be installed since 1910 and orders for further high precision balances have already been placed with Stanton Instruments for delivery during the next two years.

The 10 kg. balance is of the conventional three-knife edge design and is fitted with a special optical reading system. It will be used for the testing of larger weights and is expected to provide a precision of weighing of not less than 1 in 100 million.

Technical Documentation in Chemistry

A meeting of the scientific and technical documentation and information in chemistry will take place in Milan, 9-10 November. Held under the auspices of the International Union of Pure and Applied Chemistry and the Federation of the Scientific and Technical Associations of Milan, the meeting is organised by the Italian Chemical Society, the Italian Society of Pharmaceutical Sciences and the Italian Association of Chemical Engineering with the co-operation of the Centre Française d'Echages et de Documentation Technique.

Symposium on Vacuum Science

The Institute of Physics and the Physical Society will hold a one-day symposium on 'Some aspects of vacuum science and technology', at Imperial College on 5 January. The symposium will cover continuously exhausted bakeable vacuum apparatus for pressures below 10^{-6} mm. of mercury; and the controlled deposition of evaporated film.

Overseas News

JAPANESE FIRMS SIGN POLYCARBONATE CONTRACT WITH BAYER

TWO Japanese firms—Edogawa Chemical and Teijin Kasei—have signed contracts with Bayer concerning polycarbonate production techniques. The patent fee involved is \$500,000. Application is shortly to be made to MITI for permission to introduce the Bayer techniques. Both companies are planning plant, upon approval. Teijin Kasei will construct a 150 tonnes a month plant based on the ester exchange process and involving an investment of 500 million yen (£500,000). This will give Teijin Kasei a total capacity of 300 tonnes a month, including their existing phosgenation process plant. Edogawa Chemical are already operating a 30 tonnes a month semi commercial plant, the capacity of which is to be doubled. An additional 150 tonnes a month plant will also be constructed. This new plant represents an investment of 500 to 600 million yen.

Details Announced of Dow's Spanish Plans

At the first annual general meeting of Dow-Unquinesa, Spain, the president of the company, Conde del Cadagua, said that the new petrochemical plant would be erected at Somorrostro, near Bilbao. The plant, which should be completed in two years, will be capable of producing 10,000 tonnes of high pressure polythene, 6,000 tonnes of low pressure polythene, 8,000 tonnes of polypropylene and 12,000 tonnes of monomer styrene.

Houdry's Italian Link on Polyurethane Foam

In their fourth overseas link—the most recent one was with Hüls to make catalysts in Germany—Houdry Process Corporation, Philadelphia, have formed a joint company—Montecassino S.p.A.—with Compagnie Internazionale Generale Industriale-Malatesta S.p.A. of Italy to make polyurethane foams. The new company is on a 50-50 basis and its plant at Cassino will be operational before the end of the year. Houdry already produce triethylenediamine catalyst for polyurethane foams, but other raw materials will be bought in.

Yugoslavia's Big Rise in Chemical Exports

Over last year Yugoslav chemical exports were higher by 50% than those for 1959 and by 21% than those for 1957, the previous post-war record year. The share of chemical exports in the country's total industrial exports thus rose from 3% to 4.3%. Exports of inorganic products rose within the overall total by 47.6% over the year, though their quantitative share in combined chemical exports fell from 57% to 56%.

Value of organic products compared with total chemical exports now stands at almost 64%.

Over the same year imports of chemical products fell by 15% quantitatively and 5% in value. The share of chemical imports in total Yugoslav industrial imports has thus decreased from 14.2% to 10%.

Hormone Agreement Between Italian and Mexican Firms

Societa Recordati di Milan has made an agreement with Syntex of Mexico City whereby hormone preparations produced by the Mexican firm will be manufactured and distributed in Italy.

Big Output Increases Ahead for Polish Chemical Industry

Recently released figures for chemical production in Poland in 1960 make it possible to compare these figures with those that will be realised by 1965 if present expansion plans for the industry are fully carried out. The figures, in tonnes, are as follows:

	1960	1965
Sulphuric acid	684,000	1,325,000
Caustic soda	172,500	284,000
Calcined soda	528,500	740,000
Chlorine	55,200	161,000
Phosphatic fertilisers (P ₂ O ₅ content)	207,000	400,000
Nitrogen fertilisers (N ₂ content)	270,000	464,000
P.v.c.	13,400	60,000
Polystyrene	3,100	12,500
Paints and enamels	92,800	181,000
Phenol	16,300	38,000

Other output figures for 1960 include ammonia, 346,100 tonnes; calcium carbide, 320,600 tonnes; synthetic rubber, 20,200 tonnes. By 1965, outputs of chemicals not included in the above table should be: sulphur, 411,500 tonnes; polythene, 10,000 tonnes; nylon type fibres, 12,000 tonnes; acrylic fibres, 10,000 tonnes; polyester fibres, 7,000 tonnes.

Price Cuts for Du Pont Teflon FEP Film

Prices of Teflon FEP-fluorocarbon film have been reduced by Du Pont de Nemours International S.A. by \$3/lb. This new price move, the second within six months, is primarily the result of a recent reduction in the price of Teflon FEP-fluorocarbon resin by Du Pont.

Following the new reduction, the price of FEP film 2 mils or thicker now stands at \$10/lb. One-mil film is \$11.50/lb. and half-mil, \$15/lb.

U.A.R. Interest Reported in Israeli Desalting Process

The United Arab Republic is reported to have approached U.S. partners of the Israel Government to acquire an Israeli process for the desalination of sea water by freezing and vaporising. The process

was invented by Dr. A. Zarchim, a Soviet refugee living in Tel Aviv. The U.S. concern—Fairbanks-Whitney Corporation who are already tooling for mass production—advised the U.A.R. to negotiate direct with Israel. Mr. M. Bentov, Israel Minister of Development, stated that he would be prepared to sell the equipment to Cairo after it had gone into production in three years.

German Aid for Pakistan Fibre Plant

Didier-Werke, Wiesbaden, will build a chemical-fibre plant in Pakistan for the local company Kohinoor Rayon Ltd. Costing the equivalent of £6.75 million, the unit will take as raw material cotton linters and molasses. Didier-Werke will take over a 20% holding in Kohinoor as a result of the contract.

Approval Given for New Mexican Phenol Plant

The Mexican authorities have granted two Mexican citizens permission to erect a plant for the production of phenol, basic materials for which will be obtained from the Pemex oil refinery at Minatitlán. The plant concerned will be built in Hidalgo State at a cost of 5 million pesos. To be operated by a new company named Productora Mexicana de Fenol S.A., the unit will produce some 5,000 annual tonnes of phenol. The Government grant is subject to the provision that at least 60% of the new company remains in Mexican hands.

U.S. Chemical Company in 'Share Fraud' Case

Public Prosecutor Robert M. Morgenthau has issued a suit against seven stockbrokers' firms and 26 individual persons alleging conspiracy in the sale of 575,000 shares of United Dye and Chemical Corporation 'to the prejudice of the public.' The company concerned currently bears the name Chemical Industries. It is claimed that share manipulation and false declaration about the company's profit situation and prospects resulted in the general public being cheated to the tune of over \$5 million. After the shares in question were sold at prices between \$13 and \$16 they are stated to have fallen to \$1.50. Maximum penalty for individual defendants in the case of a conviction would be five years' imprisonment and \$10,000 fine.

Chinese Chemical Trading Organisation at Peking

China National Chemicals Import and Export Corporation is the name of a new Communist Chinese foreign trade body set up to take over the functions in the chemical field of the former China National Import and Export Corporation. Address of the new corporation is Erh Li Kou Hsi Chiao, Peking. With the same address are the new bodies China National Metals and Minerals Import and Export Corporation (replacing the former Metals and Minerals Corporation) and China National Machinery

Import and Export Corporation (replacing three former organisations dealing in machinery, instruments and transport machinery, respectively).

Based at 48 Tung An Men Street, Peking, are the new bodies China National Textiles Import and Export Corporation (replacing former Silk Corporation) and textile side of Sundries Corporation) and China National Light Industries Import and Export Corporation (replacing other activities of Sundries Corporation).

U.S.A.E.C. Offers British Patents for Licensing

The U.S. Atomic Energy Commission, Washington 25, D.C., has announced the titles of 94 A.E.C.-owned British patents on which it will grant licences for royalties. The action is pursuant to a Commission policy announced in January 1961, that foreign patents would be available for licensing under certain circumstances.

Spain to Liberalise Chemical Imports

From 1 September Spain will liberalise imports of chemicals, fats, oils and microscopes, as well as a number of other products, under O.E.E.C. arrangements.

New Styrene Plant for Ethyl-Synthese

Ethyl-Synthese, France, are to build a styrene plant with a capacity of 25,000 to 30,000 tonnes a year. The unit will be designed and constructed by Soc. Belge de l'Azote et des Produits Chimiques de Marly (S.A.B.) and will use the Koppers process under licence. The plant will be sited at Lillebonne. Ethyl-Synthese already have a styrene plant at Mazingarbe also constructed by S.A.B. The new unit is the fifth styrene plant built by S.B.A. in Europe based on the Koppers process.

Polish Process Gives Pure Boron from Boric Acid

Pure boron is obtained from boric acid by a new Polish process, details of which have now been released. Boric acid is sintered with carbon and the mixture treated with chlorine at 700° C to convert it to BCl₃. The impure BCl₃ is fraction-distilled and the purified product reduced in a quartz tube and in the presence of hydrogen. Boron containing 0.01 per cent Si and 10⁻⁶ per cent Mg is precipitated on the wall of the tube. This is melted in a boron-nitrid crucible under vacuum and crystallised.

New Chemical Combines for Yugoslavia

Chlorine, chlorine compounds, organic and inorganic acids, inorganic salts and plant protection chemicals are all to be produced at a new Yugoslav chemical works, now in the design stage. To be operated under the name 'Biljana Combine', the plant will be situated in Macedonia. To cost a provisional total of 6,200,000,000 dinars, the plant's erection will take several years. Most raw materials to be processed at the Biljana

unit will be of Yugoslav origin.

Also announced is the future opening—possibly before the end of the current year—of a new chemical combine with an annual capacity of 4,500 tonnes of chemical fibres and acetylene products at Skopje, Yugoslavia.

Lonza to Produce More Petrochemicals

Lonza Elektrizitätswerke und Chemische Fabriken AG, Basle, are planning to expand their production of petrochemicals. To finance this and other production expansion, the company is expected to resort to the capital market early next year.

Brazilian Sodium Carbonate Plant in Operation

The Fabrica de Alcalis concern of Cabo Frio, Brazil, have started production of sodium carbonate in what is said to be one of the world's most modern plants of its kind. Production, which is to be brought up to 350 tonnes/day, is already above the level originally planned. It is possible to increase capacity further to 400 tonnes/day in the future, in which case 60 tonnes/day of caustic soda would be produced as by-product.

Indian Heavy Water Plant on Stream this Year

India's first heavy water plant, being built with Federal German aid at Nangal, is now expected to start production during the current year. Initial capacity will be of 14.5 tonnes annually, of which one-half will go to the Indian Atomic Energy Commission and one-half for export to under-developed countries. Cost of the plant is estimated at Rs11,500,000.

Hooker Will Be Half-owner in New Argentine Phenol Company

OPTION of Hooker Chemical Corporation, New York, to purchase enough stock of a new Argentine phenol and monochlorobenzene producer, Duranor, Industrias Químicas Sociedad Anonima Industrial y Comercial, to bring their interests to 50%, is now to be exercised. An equivalent investment in the jointly owned company will be held by a major Argentine manufacturer of chemicals and plastics, Atanor, Compania Nacional para la Industria Química, S.A.M., Buenos Aires.

The Export-Import Bank of Washington, D.C., has agreed to loan Duranor \$2 million for purchasing necessary chemical plant equipment in the U.S. Shipment of U.S.-manufactured equipment is expected to begin late September and ground will be broken in about three months.

The new Duranor chemical plant is Hooker's first step in a planned expansion of company activities in Argentina. Duranor will produce 25 tonnes of phenol per day. Also produced will be approximately 100 tonnes/month of monochlorobenzene for sale over and

Esso's Lube Oil Plant in Sicily

It has been confirmed that the capacity of lubricants plant which Esso Standard Italiana are to build, in cooperation with Rasim, near the refinery at Augusta, Sicily, will total about 200,000 tonnes a year, or about double Italy's potential in this field. The new plant will utilise processes recently developed by Esso Research and Engineering Co.

Consumption of Natural Gas in Italy

During 1960, 6,500 million cu. m. of methane was distributed in Italy. Most of this (84%) was used by various industries either as a fuel or as a raw material. The rest was used for motor fuel or in private homes. Owing to the competition from liquefied petroleum gases and to the recent substantial reduction in the price of petrol, the use of methane to drive cars has decreased from 234 million cu. m. in 1958 to 212 million cu. m. in 1960.

Sicily Protests Against Imports of Pyrites

Following reports that the Ministry of Foreign Trade, Rome, is granting an import licence for the import of 60,000 tonnes of pyrites for use in Sicily, the Sicilian Government Industry and Trade Board has drawn the attention of the Ministry and the Ministry of Industry in Rome to the fact that the planned imports would reflect adversely on the reorganisation plan of Sicilian sulphur industry. It is also stated that imports of pyrites would be contrary to the decisions of the European Economic Community concerning the development of the Italian sulphur industry.

above Duranor's needs. Facilities will also be installed for processing by-product dichlorobenzenes, for sale.

Largest customer for the phenol to be produced will be Plasticos Atanor, an Atanor subsidiary located at Munro, for the manufacture of phenolic resins and moulding compounds. Argentina now imports much of its phenol for use not only in plastics but also for the manufacture of 2,4-D, sheet and cattle dips, miticides, herbicides, fungicides, insecticides, antiseptics, salicylic acid which is a raw material for aspirin, and other miscellaneous uses.

The Duranor facility will be located at Rio Tercero, some 450 miles north-west of Buenos Aires and adjacent to an existing Atanor plant. Atanor will be Duranor's principal supplier of chlorine, muriatic acid, steam, water, and power. Fish International Corporation are general contractors for engineering and construction.

Hooker Chemical operates 13 plants in the United States, Canada, and Mexico, and a major phenol plant is under construction in Kentucky.

NEW YORK CHEMICAL EXPOSITION

Advanced Techniques to be Shown for Processing and Research

THE 28th Exposition of Chemical Industries to be held at the New York Coliseum, 27 November to 1 December, will be the largest ever. More than 500 exhibitors will cover processing equipment, instruments, material handling machinery, packaging equipment and packaging products. Special sections will be devoted to laboratory equipment and supplies, as well as to chemicals and raw materials.

Basic processing equipment will cover such steps as size reduction by grinding and pulverising, delumping and classifying, and separations by filtration, screening and classifying. Feeding methods will include pumping of liquids, conveying of solids, measuring and weighing, mechanical and electrical drives. Blending and mixing systems will integrate many substances in liquid, solid and gaseous phases.

Control systems will be an important element in the display, ranging from a variety of valves—with top interest shared by high grade alloys and plastics materials—to extensive control loops, capable of bringing entire plants under computer operation. Among innovations will be several tie-in systems, the purpose of which is to translate digital programmes on cards or tape into step-by-step adjustments to establish automatic control of existing processes.

An automatic viscosity control is applicable to any process requiring continuous measurement of viscosity with automatic addition of solvent to compensate for evaporation, while a low-cost continuous blending system uses plastic clip cards and a simplified card reader control unit, and can be operated without special computer training.

Another liquid blending control employs electronic load cells as a means for proportioning by weight. Storage and transfer tanks are mounted on the load cells, which sense change in weight when the product enters or leaves, and transmit a proportionate voltage to the control panel, from which adjustments are effected by means of automatic valves.

Volumetric Blending

A volumetric blending system operates by measuring total volume, rather than the flow rates of individual streams. It can be made to combine as many as 20 individual streams, 'remembers' any deviation of a constituent stream from the total volume required in the product and applies the necessary compensation.

An in-line refractometer has been developed to measure the composition of process streams, while a new liquid chromatography refractometer is applicable to highly sensitive measurements in viscous process streams. An electro-

phoresis densitometer combines in a single unit an electric photometer, automatic scanning mechanism and complete variable response recorder.

Research in the application of high heat release combustion to heat exchange, inert gas generation and chemical concentration has resulted in a completely engineered system for disposing of gaseous or liquid wastes by high temperature combustion or catalytic means. A catalytic oxidation system for fume elimination, heat and power recovery and process gas purification employs precious metals, electrolytically deposited on nickel alloy supports. A line of exhaust purifiers has been developed for engines used inside plants, as on lift trucks and tractors, while from the same source will come an oxy cat system for solving industrial process tail gas and air pollution problems.

Air Purification

The ultimate in fine particle retention is required in the field of air purification to meet the growing demands of anti-air pollution ordinances and the even more rigid standards of 'white rooms', as well as critical conditions in the upper temperature ranges. Improvements in this field are typified by the introduction of glass cloth tubes in air filters for high temperature service, and a new quick-change method for securing screen cloth by means of clips which apply a two-dimensional tension to the screen, to prevent buckling or sagging.

The need for low maintenance under continuous operation has led to improvements in a constant suction cloth bag dust collector system which consists of a unique travelling cleaner unit which purges one bag at a time by reverse air blast, while adjoining bags are sealed off by flexible rollers to prevent pick-up of dislodged material. The system continues in operation while the collecting cells are being scoured one by one. In a wet-impingement scrubber, dust- or fume-laden gas is pressure fed through a humidifying spray, then forced through a plate pierced with thousands of tiny orifices to produce jets, which impinge on a baffle grid. Solids are spray-washed from the baffles while the scrubbed gas is evacuated through a mist eliminator.

One exhibitor has invented a filter cake thickness indicator—terming it "one of the tools to make automation work". Another has developed a porous metal element formed by precise fusion of stainless steel particles. The granules are statistically sampled and sized for retention ratings from 40 down to 2 micron sizes, then sintered in the form of a cylindrical capsule.

A line of pressure filters for liquid

clarification employs a flexing tube based on the ancient Chinese 'finger trap'. Under pressure, the tube shrinks and elongates, decreasing the interstices between the fibres, but resumes its normal dimensions when pressure is released. In this way it dislodges the cake and presents a clean surface for the succeeding run.

Liquid transfer problems, always critical in chemical processing and often challenging, have stimulated many new designs. In a liquid oxygen pump, no liquid comes in contact with the mechanical seal.

A complete line of polythene and polypropylene drainage fittings will be exhibited for the first time. There will also be a display of synthetic filter fabrics, both woven and felted, made from monofilament, multifilament and spun staple yarns.

Latest developments to be shown in metal alloys will include a weldable columbium-base alloy having 25,000 p.s.i. ultimate strength at 2,400°F, castings for pump and valve bodies having a better finish than rosin-shell, but costing less than investment castings, and other parts protected by a plasma-arc facing.

The exposition is under the management of the International Exposition Co., with permanent headquarters at 480 Lexington Avenue, New York 17, N.Y.

Rubber Federation President's Review

In his review on two years of office as President of the Federation of British Rubber and Allied Manufacturers, Mr. H. G. W. Chichester-Miles commented on the challenge of new materials to the established industry. He said that the new materials were better, not worse, than the old and should be welcomed for the opportunities they presented of widening the scope of the industry. New materials lead to new uses and new products, to opportunity expansion and progress.

He reviewed the work of the Products Groups of the Federation. The pattern was set for these after 1958 by the Plant Lining Group, which was formed primarily to revive interest in rubber and ebonite linings for chemical plant in view of the one-sided publicity which was being widely obtained for plastics in this field. More recently a Sealant Manufacturers' Conference has been formed with a view to devising performance standards for polymer-based sealants as used in the modern building industry. The work of the Conference should be of great value to architects and builders and it hoped that it should forestall any possibility of a new product falling into temporary disrepute through the customers' inability to distinguish between serviceable and inferior grades without technical assistance.

Bookshelf

STEAM PRODUCTION AND LARGE-SCALE WATER COOLING

INDUSTRIAL WATER TREATMENT PRACTICE. Edited by P. Hamer, J. Jackson and E. F. Thurston. Butterworths, London, 1961. Pp. xv + 514. 95s.

According to its preface, this handbook on the treatment of water for steam production and as cooling-water is a modified up-to-date version of a volume prepared by and for I.C.I. Ltd. In general, after describing the effects of the impurities in natural waters it contains accounts of the three principal ways of softening water—precipitation, ion-exchange and by evaporation together with the factors to consider in making a suitable choice. This material (with the possible exception of the newer principle of electrodialysis desalting) is liberally illustrated by tables and drawings.

All aspects of boilers and boiler systems are likewise adequately considered in a set of eight chapters; these embrace operating problems, scales and deposits, corrosion, stationary, locomotive and marine boilers. Equally good accounts of cooling-water, control of organic growths, clarification and colour removal by both coagulation and filtration fill the final chapters followed by a large appendix of relevant physico-chemical data and a collection of about 500 references.

All those concerned with steam production and large-scale cooling of water in the chemical industry, railways, ships, electricity generation and so on will find this valuable record based on such a vast amount of practical experience very good value indeed.

► Azo and Diazo Chemistry

AZO AND DIAZO CHEMISTRY. By Heinrich Zollinger, translated by H. E. Nursten. Interscience Publishers Ltd., London and New York, 1961. Pp. 444. 112s.

This work furnishes an extensive survey of the fundamental chemistry of both the aliphatic and aromatic representatives of these classes of compound. So many fields of organic chemistry are touched on in this book, that any organic chemist is certain to find much of interest in it. The author confesses to a predilection for the application of kinetic studies to the elucidation of reaction mechanism, and he does indeed devote a substantial proportion of the book to authoritative discussions on mechanism, as well as on the structures of the azo and diazo compounds. The reactions of aliphatic and aromatic diazo compounds are classified according to mechanism, the coupling reaction and the mechanism of the diazotisation process naturally receive chapters to themselves. However,

an admirable balance has been maintained, and Professor Zollinger also furnishes the reader with a first-class descriptive account of the preparations and properties of these families of compounds and of their applications in general organic synthesis. The technology of azo dyestuffs does not fall within the scope of the book, but there is a chapter on technological applications of the theory of the coupling process. Minor topics dealt with include light absorption, and azo dye metal complexes. Author and subject indices are provided, and there is an extensive list of literature references. English-speaking chemists are indebted to Dr. Nursten for making available such a readable translation of this valuable work.

► Fire Hazards

THE CLASSIFICATION OF FIRE HAZARDS AND EXTINCTION METHODS. By J. D. Birchall. Benn, London, 1961. Pp. 127. 18s.

This is the second edition of a book first published in 1952. The title describes the contents with unusual accuracy. The text is devoted to tabulations of the hazards and extinction methods amplified by copious notes. The new edition treats the few new extinction methods and devotes more space to dry chemical powders which have increased in popularity. A new chapter of 10 pages on atoms, isotopes and atomic energy follows a different approach from the rest of the book and seems out of place.

This is not a book for chemists, indeed little or no chemical training is assumed and the author's knowledge is clearly limited. It should continue to be a useful work of reference for the fire officers for whom it is intended.

► Computers

AUTOMATIC CONTROL AND COMPUTER ENGINEERING, VOL. 1. Edited by V. V. Solodovnikov. Translated by J. Yeoman. Pergamon, Oxford, 1961. Pp. x + 502. 100s.

This book is the translation of 24 papers delivered to the conference of the Scientific Technical Society of the Instrument Making Industry. No date is given, but from internal evidence it appears that the papers were originally written early in 1957; they were published in Russia in 1958. This delay is particularly serious in such a fast moving field. Nothing dates so quickly as yesterday's technology. Several of the papers treat computer design and operation from a fundamental point of view. Many are concerned with detailed

descriptions of computer controlled industrial plant. Few of the papers list sufficient references for them to serve as adequate reviews of Soviet work. Several give no references at all. One is subtitled "A Brief Survey of Foreign Periodicals". There is no record of a discussion. The references of most papers are predominantly to Anglo-Saxon periodicals.

Collections of conference papers from any country are usually of little permanent value unless the conference has been on 'Faraday' lines. The inevitable delay of translation is a further drawback. Translations of authoritative monographs would be much more valuable.

► Microscopy

THE ENCYCLOPEDIA OF MICROSCOPY. Edited by G. L. Clark. Chapman and Hall, London; Reinhold, New York, 1961. Pp. xiv + 693. 200s.

This volume is a companion to the 'Encyclopædia of Spectroscopy' which was recently noticed in these columns. Microscopy is better suited to encyclopaedic treatment because the coherent presentation of fundamental theory is less important and the theory is much more limited. There are 26 kinds of microscopy covered, each divided into numerous sub-topics which may cover more than 10 pages and are frequently supplemented by very full references. There is no index, an omission which is not compensated for by a full table of contents. One man cannot adequately review such a varied work, but it may be noted that the level of treatment of topics is uneven. Few people will wish to refer constantly to this book. On the other hand many may consult it occasionally.

► Dissociation Constants

DISSOCIATION CONSTANTS OF ORGANIC ACIDS IN AQUEOUS SOLUTION. By G. Kortüm, W. Vogel and K. Andrussov. Butterworths, London, 1961. Pp. xii + 357. 50s.

By taking what are regarded as the most reliable published figures from 1927 to 1956 inclusive, tables of the title subject have been compiled at the request and with the assistance of the I.U.P.A.C. as a part of the work of the Commission on Electrochemical Data. About 1,200 acids have been considered and the table for each (in German) contains pertinent comments on the degree of reliability, the method used, the ionic strength and the temperatures covered. The selected data are based on conductance, e.m.f., acid catalysis and optical density measurements and the relevant theoretical treatments are briefly but very clearly surveyed and discussed in a separate chapter (given in both English and in German).

Possibly the main criticisms that can be made are that it does not go beyond 1956 and does not include information relating to mixed solvents. Within this scope it is undoubtedly a most valuable reference book for electrochemists and for purchase by chemistry libraries.

● **Mr. Norman J. Travis and Mr. James D. Tennant**, directors of Borax (Holdings) Ltd., have been appointed to the board of Hardman and Holden Ltd.

● **Mr. E. J. G. Toxopeus** was appointed a director of Shell Nederland Chemische Fabrieken NV, Pernis, on 1 August.

● **Mr. K. R. Marlow** has been appointed sales manager of Plycol Ltd., Dundee Road Trading Estate, Slough, Bucks, marketing organisation for the specialised building materials manufactured by the I.B.E. Group. In view of Plycol's expanding export trade, Mr. H. Parslow has been appointed export manager and will spend much of his time abroad.

● **Dr. C. J. Jackson, O.B.E.**, who advises the Distillers Company Ltd. on questions relating to water supply and effluent disposal, has been appointed a member of the Central Advisory Water Committee for England and Wales. The appointment has been made by the Minister of Housing and Local Government.

● **Dr. F. C. Lloyd** has joined F. W. Berk and Co. Ltd. in the position of development director, although not a



Dr. F. C. Lloyd

member of the main board. He was formerly research manager of B.X. Plastics Ltd.

● Two new executive directors appointed to the board of the Cape Asbestos Co. Ltd. are **Mr. I. C. Dawson**, responsible for the group's engineering division; and **Dr. R. Gaze**, the group's chief scientist. Other members of the board of the company (which under the decentralisation of January this year became the holding company for the whole Cape Group) are Mr. Giles Newton (chairman), Mr. R. H. Dent (deputy chairman and managing director), Mr. G. Courtauld, Lord Elton, Mr. R. St. G. Riley, Mr. S. D. H. Pollen and Mr. T. Muir Warden.

● **Mr. E. J. Fleetwood** has been appointed pharmaceutical sales adviser to the joint managing director (commercial) of Howards of Ilford Ltd. **Mr. R. F. York** becomes home sales manager.

● **Mr. F. D. Wayre** of Dextine Rubber Co. Ltd. has been elected chairman of the Plant Lining Group of the Federation of British Rubber and Allied Manufacturers for 1961-62. **Mr. F. C. Wilks** (BTR Industries Ltd.) is the new vice-

PEOPLE in the news

chairman and **Mr. J. T. Hall** (Dextine Rubber) has been elected chairman of the technical panel.

● Directors of Cerebos Ltd. who have been appointed chairmen of the principal U.K. subsidiary companies are: **Mr. L. H. McRobert**, chairman of Cerebos, as chairman of Scott (Midlothian) Ltd. and A. and R. Scott Ltd.; **Mr. J. R. Richardson** as chairman of John Crampton and Co. Ltd.; **Mr. R. R. Seddon** as chairman of Stamina Foods and Middlewich Salt Co. Ltd.; and **Mr. G. Chignell** as chairman of Brand and Co. Ltd. **Mr. W. A. Wallace**, resident director of the Scott Group, has been elected chairman of Scott's Hy-Line Feeds, while **Lt. Col W. B. P. Bradish** has been appointed chairman of Cerebos (Ireland) Ltd.

● **Mr. Donald B. Hirsch** of Lancaster is to join Monsanto Chemical Co.'s Overseas Division as manager of economic planning for Europe on 1 September. He will be located in St. Louis until January, 1962, after which he will make his headquarters in Geneva, Switzerland. Mr. Hirsch, who has been head of the market research operation for Dow Chemical International, has, most recently, been doing consulting work in New York City for the Economist Intelligence Unit of London.

● **Mr. L. S. Kinnear** has resigned from the board of the British Oxygen Co. Ltd.

● **Mr. F. W. Clibbery** has been appointed managing director of Amal Ltd., a subsidiary of I.C.I. **Mr. R. G. Hutchings** and **Mr. D. S. Izon** have been appointed directors.

● **Dr. J. Davoll** and **Dr. S. J. Corne** are representing Parke, Davis and Co., the Hounslow manufacturing chemists, at the 5th International Congress of Biochemistry, Moscow 10-16 August. The congress is organised by the U.S.S.R. Biochemical Society, under the auspices of the International Union of Biochemistry. The conference will have an attendance of 2,000 delegates from all over the world, the British contingent numbering 200.

● Nuclear Developments Ltd., the company set up in April by I.C.I. Metal Division, Rolls-Royce Ltd. and the Rio Tinto Co. Ltd. to process and manufac-

ture nuclear fuel materials and to fabricate reactor fuel elements, have appointed **Mr. S. S. Smith**, research manager of I.C.I. Metals Division as executive director and general manager. Since 1941, Mr. Smith has been concerned with research and development work on nuclear engineering materials. The following have been appointed to the board of the new company: **J. N. V. Duncan, O.B.E.** (managing director, Rio Tinto), chairman; **R. W. Wright** (deputy managing director, Rio Tinto); **Sir Mark Turner** (director, Rio Tinto); **J. D. Pearson** (chief executive and deputy chairman, Rolls-Royce); **A. A. Rubbra, C.B.E.** (director, Rolls-Royce); **L. Barman** (special executive, Rolls Royce); **Dr. J. Taylor, M.B.E.** (director, I.C.I.); **St. J. de H. Elstob, C.B.E.** (chairman, I.C.I. Metals Division) and **Dr. R. L. P. Berry** (director, I.C.I. Metals Division).

● The title of reader has been conferred on **Dr. I. G. M. Campbell**, senior lecturer in the Department of Chemistry of the University of Southampton.

● **Mr. P. C. Fryer**, of Morgan Crucible, has joined the staff of the Lead Development Association where he will be mainly engaged in development work for the lead industry in the battery field.

● **Herr Eberhard Wachendorf**, of Offenbach, and **State Councillor Walter Mosthaf**, of Stuttgart, have been elected to the board of Rudolph Koepf and Co., Chemische Fabrik AG, of Oestrich, West Germany. They replace **Professor Edmund Natter**, Stuttgart, and the late **Herr Theo Hengstenberg**, Wiesbaden.

● **Dr. B. A. Southgate**, director of the D.S.I.R. Water Pollution Research Laboratory, is chairman of the newly formed Industrial Water and Effluents Group of the Society of Chemical Industry. The new group will be concerned with the broad subject of industrial water, from supply, through treatment and use to ultimate disposal.

● **Mr. A. Luis Antommarchi**, who formerly held posts with Celanese and Solvay Process Division, has been appointed export manager of the International Division of Baird Chemical Corporation, New York. He will direct Baird's overseas marketing programme, including the sale of the company's new production of sorbitol.

● **Dr. Kurt Eisfeld** and **Dr. Wolfgang Kind**, vice-directors of Dynamit Nobel AG, Troisdorf, West Germany, have been appointed full directors of the company's board.

● **Mr. A. W. Jones** (Fleming Radio (Developments) Ltd.) has been elected president of the Scientific Instrument Manufacturers' Association in succession to **Mr. G. C. Ottway** (W. Ottway and Co. Ltd.), who now becomes a vice-president. Other officers elected are: Vice-president and president-elect, **Mr. R. E. Burnett** (Marconi Instruments Ltd.); hon. secretary, **Major Wm. Logan** (Avo Ltd.); and hon. treasurer, **Mr. G. S. Sturrock** (Kelvin and Hughes Ltd.). Newly elected to the council are: **Mr. J. E. C. Bailey**,
(Continued on page 236)

Commercial News

Anchor Chemical

Group profit of the Anchor Chemical Co. Ltd. for the six months ended 31 May, after all charges except tax and subject to audit, was £97,767, compared with £125,881 in the same period last year—a period of abnormally high trading for the company. The figure for the first six months of 1959, the second most successful year in the company's history, was £76,914. Interim dividend is 6% (same).

In the period under review, sales of rubber chemicals were affected by the lower level of trading in the British car industry. Profitability was also affected by higher promotional costs in developing sales of Cyolac, the high impact plastics material for which a "very important future is forecast." Sales of this product, says Mr. F. Savaage, chairman, are progressing "most satisfactorily" at home and overseas.

Borax (Holdings) Ltd.

Borax (Holdings) Ltd. are to pay an interim for the year ending 30 September of 4% on deferred ordinary stock.

Unilever

Unilever Ltd. have purchased the whole of the issued capital of E. R. Holloway Ltd., producers of injected moulded and welded articles, polythene bottles and containers and toilet preparations, which are manufactured or sold by five wholly-owned subsidiaries of Holloway: Affiliated Manufacturing Agencies Ltd., Barnet Comb Co. Ltd., Holloway (Sales) Ltd., Holloway Containers Ltd. and Hydeway Ltd.

Allied Chemical

Allied Chemical and Dye Corporation report for the first half of the current year net profit of \$25,700,000 or \$1.28 per share (\$30,900,000 or \$1.55/share). Turnover for the period totalled \$379,900,000 (\$401 million). These figures include second-quarter totals of \$211,300,000 (\$216,900,000) turnover, \$16,200,000 (\$17,400,000) net profit and 81 (87) cents net profit per share.

Celanese of America

The Celanese Corporation of America recorded for the first half of 1961 a turnover of \$133,500,000 (\$137,500,000). Net profit fell over the period from \$10,100,000 to \$8,600,000, or from \$1.05 to 83 cents/share. For the second quarter turnover was \$71,500,000 (\$70,700,000) and net profit \$5,100,000 (\$5,200,000), or 52 (55) cents/share.

Chemische Werke Hüls

Chemische Werke Hüls AG, Marl, West Germany, have declared a dividend of 17% on capital of DM180 million for 1960, compared with 15% on DM150 million capital. Net profit was DM26,800,000 or £2.43 million

- Down-turn in Cars Affects Anchor
- Allied's Half-year Net Profit Down
- Hüls 1960 Turnover Rose by 14%
- Diamond Alkali Acquire Chemical Process

(DM22,500,000 or £2 million). Total turnover for the year was up 14% at DM709 million (or £63.5 million) (DM615,500,000 or £54.9 million). Chemische Werke Hüls, who are owned 50% by the Frankfurt-on-Main holding company Chemieeverwaltungs-AG, 25% by the State-owned coal company Bergwerksgesellschaft Hibernia AG, Herne, and 25% by the coal-processing concern Kohle-Verwertungs-GmbH, Essen, recorded for 1960 a fall of the share of export sales in total sales from 34% to 32%. The company's board has now been empowered to raise capital by a further DM30 million by 1966.

Among 1960 investments were sums for the raising of Vestolit p.v.c. output to 80,000 annual tonnes, that of acetylene to 100,000 annual tonnes and that of power for own use to 350,000 kWh. Capacity of the C.W.H. part-subsidiary Bunawerke Hüls GmbH, Marl, has been increased to 120,000 tonnes of synthetic rubber per year; over last year the company produced some 71,000 tonnes. Bunawerke Hüls recorded a slight profit for last year as compared with a loss of DM6 million in 1959; over the current financial year C.W.H. are to invest some DM12 million in Bunawerke.

Future ventures of Chemische Werke Hüls include the start of polyester fibres production by Faserwerke Hüls GmbH, a joint subsidiary of C.W.H., and Eastman-Kodak, U.S., some DM40 million to be invested in this company's 5,000-6,000 tonnes fibre unit; and the start of acetic acid production by Indian Organic Chemicals Ltd., Bombay.

Diamond Alkali

Diamond Alkali, U.S., have won their struggle with Commercial Solvents for the control of Chemical Process Co. By purchasing all the stock of Chemical Process formerly held by Commercial Solvents, Diamond Alkali now control more than 80% of stockholding. Commercial Solvents decided to sell their shares because of their belief that contests among shareholders were often damaging and were not in the best interests of the chemical industry.

Houdry

Houdry Process Corporation of Philadelphia reported earnings of \$476,377 or \$1.40/share for the first half of 1961, compared with \$401,720 or \$1.21/share in the same period last year. Product sales increased substantially in the first half of 1961 compared with a year ago, but income from royalties did not keep pace with 1960.

Net income from Catalytic Construction Co., a wholly-owned subsidiary, was almost double that of the same period

in 1960. Catalytic and its Canadian subsidiary reported a record contract backlog in excess of \$70 million (\$22 million).

Donau Chemie AG

The Austrian chemical producers, Donau Chemie AG, Vienna, report for last year a quantitative sales increase of 14% and in value of 9%. On a basic capital of Sch80 million, it is planned to grant a 1960 dividend of 5% (4%) after net profit of Sch4,300,000. During last year, in which Donau Chemie invested a total of some Sch30 million (Sch15 million), the company was able to resume exports after a period of years producing for domestic consumers only.

Dominion Tar

There is an apparent trend towards improving sales and profits, with the second quarter of 1961 showing a substantially better ratio to 1960 than did the first quarter, states Mr. W. N. Hall, president of Dominion Tar and Chemical Co. Ltd., in a report on the six months ended 30 June 1961. Sales totalled \$154,368,021 (\$151,485,533), while profit was \$7,242,170 (\$7,471,172).

I. G. Farben

I.G. Farben Industries AG, who are liquidating the assets of the former I.G. Farben combine had a net profit in 1960 of DM20 million (DM12.5 million). Source of profits was interest and dividends from capital freed during the year, the sale of a partnership from subsidiaries since liquidation and from repatriation of overseas assets.

National Distillers

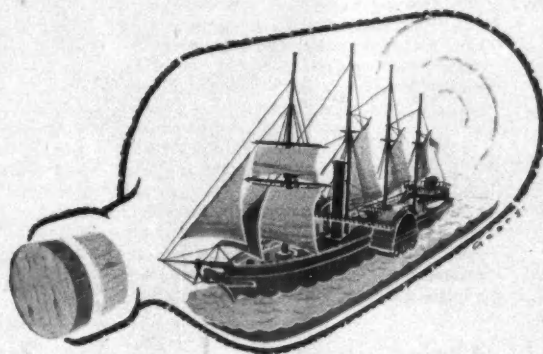
National Distillers Products Corporation, U.S., report for the first half of the current year sales of \$361,600,000 (\$358,700,000). After tax of \$11,100,000 (\$14,400,000), net profit for the period was \$13,900,000 (\$13,400,000), or 74 cents/share (99 cents). Figures for the second quarter were: Sales \$191,800,000 (\$183,900,000); net profit \$8,700,000 (\$6,300,000) and 37 cents (46 cents).

Parke Davis

Parke Davis and Co., U.S., report a net profit for the first half of 1961 of only \$9,430,000, compared with \$15,130,000 for the same period last year. This represents \$0.63 (\$1.02) per share. Turnover fell over the same period from \$99,050,000 to \$90,150,000.

Seichimie

Société d'Exploitations et d'Intérêts Chimiques et Métallurgiques (Seichimie),
(Continued on page 236)

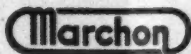


**IT'S A SMALL WORLD
AND MARCHON SURFACTANTS PLAY A BIG PART IN IT**

It's plain sailing for chemical manufacturers in many parts of the world, for Marchon ships much of its output of surfactants to overseas customers. Buyers in more than 50 countries rely on Marchon's raw materials.

PRIMARY FATTY ALCOHOLS

These are essential raw materials for a large number of chemical processes, and are of special importance to the cosmetic and detergent industries. Marchon are the only manufacturers in Great Britain with the full range of C8-C18 even-numbered homologues. Why not write for data, samples or advice?



Commercial News

(Continued from page 234)

a chemical-metallurgical French holding company, owned mainly by Pechiney, are to raise their capital from Fr35,810,000 to Fr54 million. The 454,800 new shares, each of Fr40 nominal value, will go to Pechiney in return for shares of certain Pechiney holdings, this move preceding the large-scale concentration plans of Pechiney and Saint-Gobain. It follows the decision of an extraordinary general meeting of Pechiney to allow increase of the Pechiney capital in one or several phases from Fr423,300,000 to Fr850 million.

Snia Viscosa

Application has been made to the London Stock Exchange for quotation for the entire issued Ordinary and privileged share capitals of Snia Viscosa. There is in issue Lire 30,291 million in Ordinary shares of Lire 1,200 each, and Lire 9,150 million in privileged shares of Lire 1,200 each. The privileged shares are allowed to vote only in special circumstances.

Spencer Chemical

Spencer Chemical, of the U.S., who have under construction new plant to produce nitro-carbo-nitrate, have acquired the capital of the Perkins Glue Co., producers of woodworking glues, Lansdale, Pa.

Texas Gulf Sulphur

Texas Gulf Sulphur Co. Inc. report for the second quarter of this year a net profit of \$3,300,000, or 33 cents/share (\$3,420,000 or 34 cents/share). Turnover totalled \$16,030,000 (\$16,010,000).

Union Carbide

Union Carbide, U.S., report for the first half of the current year turnover of \$747.5 million (\$771.6 million) and net profit per share of \$2.31 (\$2.70). For the second 1961 quarter results were respectively of \$383.2 million (\$376.2 million) and \$1.19 (\$1.30).

INCREASES OF CAPITAL

ORTHO PHARMACEUTICAL LTD., Saunderton, High Wycombe, Bucks. Increased by £150,000, beyond the registered capital of £50,000.

BRITISH GELATINE WORKS LTD., 149 New Bedford Road, Luton. Increased by £100, beyond the registered capital of £50,000.

BLEASDALE LTD., manufacturing chemists, etc., 23 Colliergate, York. Increased by £30,000, beyond the registered capital of £50,000.

GAS PURIFICATION AND CHEMICAL COMPANY LTD. Increased by £1 million, beyond the registered capital of £1 million.

RADIOL CHEMICALS LTD., 78 Upper Richmond Road, London S.W.15. Increased by £6,000, beyond the registered capital of £2,000.

WARD, BROOKE AND COMPANY LTD., chemical manufacturers, etc., Ash Mill, Westbourne Street, High Wycombe, Bucks. Increased by £6,000, beyond the registered capital of £10,000.

APPRECIATION OF THE LATE MR. NORMAN SHELDON

THE laboratory industry has lost one of its oldest, most highly esteemed friends by the death of Norman Sheldon. A science graduate of Imperial College, London, Sheldon won distinction as a research chemist early in his career and was elected an Associate of the Royal College of Science and a Fellow of the Royal Institute of Chemistry. For many years until his death he was chairman of the British Chemical Ware Manufacturers' Association and was also a vice-president of the British Association of Chemists. Professionally, he was responsible for the technical and sales management concerning all scientific porcelain manufactured by The Worcester Porcelain Co. Ltd., and laboratory glassware produced by John Moncrieff Ltd.

Sheldon was a "fighter" and established a reputation as a tough uncompromising and independent minded man who would not conform or be tied to any set rules. He will be specially remembered for his sterling work during the last war in connection with the Master Key Industries—a plan which ensured adequate produc-

tion of scientific porcelain and glassware, so vital to the chemist at that time—all of which involved him in forcing his way into Ministries and tackling M.P.'s in the lobbies and corridors of the House of Commons. He never gave in and was always a prominent figure in all matters concerning the industry, of which he was an ardent defender and a tremendous enthusiast.

He was also a member of the Twickenham Council and of the Middlesex County Council and fought in like manner up to the time of his death over many problems concerning housing, the welfare of old folk and hospital management.

Many people over a long period of time who were privileged to know him, will always recall with pleasure his kind and ready co-operation. His wide experience and guidance will long be remembered by his many friends and colleagues, especially in the ceramic and glass industries to which he made many valuable contributions during the past 36 years.

Market Reports

Full Business Not Yet Resumed

LONDON Home trade demand for industrial chemicals during the week has been reasonably good for the period, but contract deliveries to the chief outlets have not yet been resumed on a full scale. Overseas call is keeping up fairly well and there is a good volume of inquiry in circulation. There has been a fair demand for fertilisers, but otherwise there has been little of fresh interest to record on the agricultural chemicals market.

In the coal tar products market business is quiet in some sections, but there is an active interest in crude and refined tar and also creosote oil on home and export account.

MANCHESTER Almost without exception steady to firm price conditions have been reported this week. Contract deliveries of textile bleaching, dyeing and finishing sorts, as well as other industrial chemicals, has been adversely affected by the usual suspensions arising from holiday stoppages at the consuming end, and for the same reason new business has been on a somewhat smaller scale.

SCOTLAND There has been little change in the trading position with the holiday period still affecting some of the areas. Trading in the Glasgow area has been slow in restarting, and buying has been mostly for nominal quantities. There has been, however, some business placed for forward requirements. A reasonable volume of activity can still be reported in regard to the overseas market.

People in the News

(Continued from page 232)

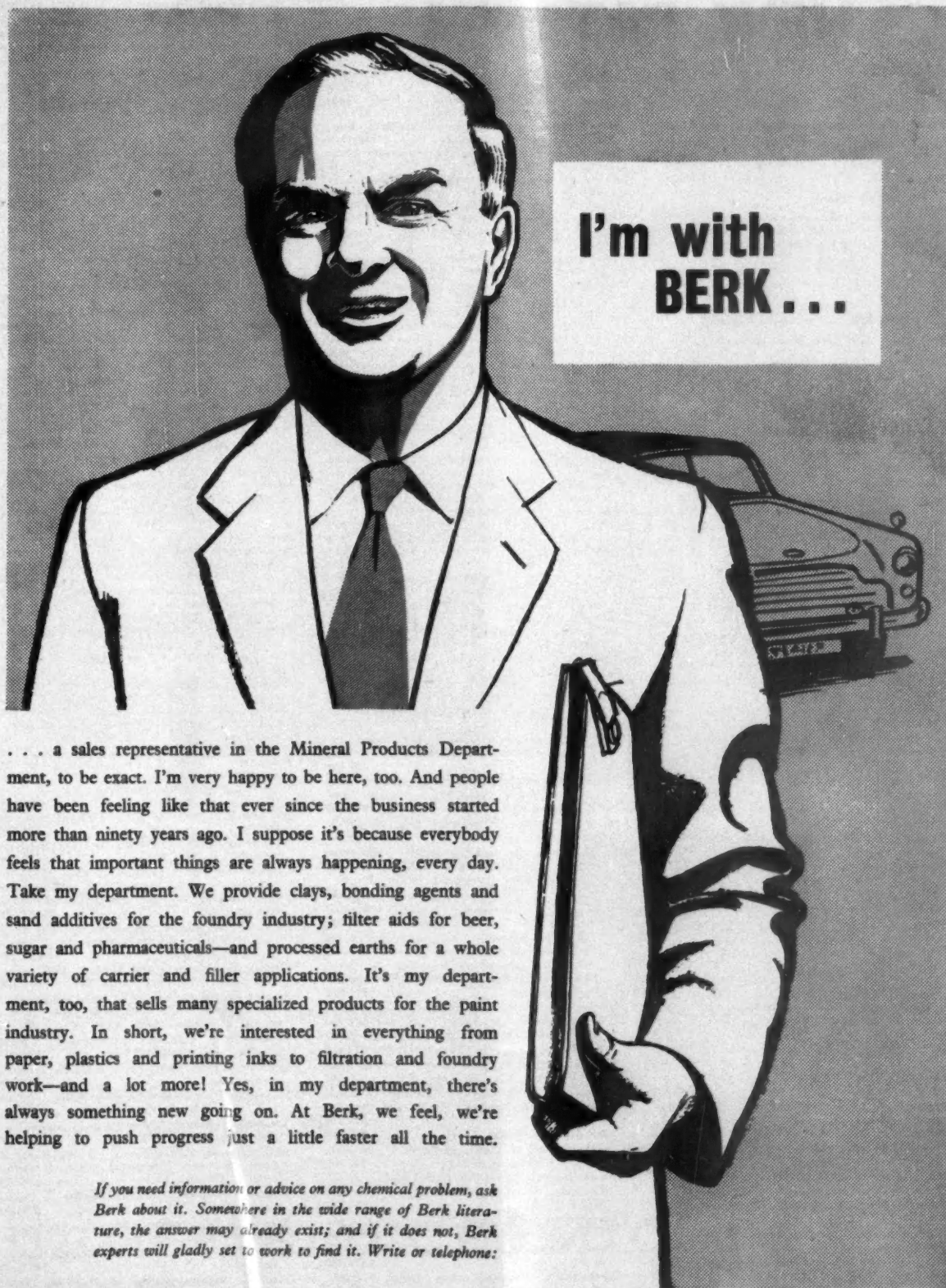
C.B.E. (Baird and Tatlock, London, Ltd.); Mr. A. G. Peacock (Mervyn Instruments Ltd.); Mr. L. B. Lambert (Negretti and Zambra Ltd.); Mr. J. E. T. Haile (Rank Precision Industries Ltd.); Mr. I. C. M. Worsfold (W. H. Sanders Electronics Ltd.); Mr. H. Wyn Griffith (Shirley Developments Ltd.); and Mr. A. Richardson (Stanhope-Seta Ltd.).

● Mr. Keith Newlands, lately sales director of Cossor Radar and Electronics Ltd., has been appointed director of overseas operations of Elliott-Automation Ltd., a new post occasioned by the company's policy of expanding its export business. The Group has ten operating subsidiary companies overseas and over a wide field of its operations exports more than a third of its products.

● Mr. Ernest G. Gross, a director of the Distillers Company Ltd. since 1954 and chairman of the Distillers Co. Biochemicals (Australia) Pty. Ltd. of Sydney has left the U.K. to take up an appointment as resident director of the Distillers Company in Australia.

Odour in Packaging

A complete report of the Institute of Packaging Conference on 'Odour in packaging' has been published in book form. Comprising 230 pages of text, with illustrations, the book is believed to be the most complete and practical work on the subject ever published. The book is available from the Institute of Packaging, Malcolm House, Empire Way, Wembley Park, Middlesex, price 25s, post free.



**I'm with
BERK...**

... a sales representative in the Mineral Products Department, to be exact. I'm very happy to be here, too. And people have been feeling like that ever since the business started more than ninety years ago. I suppose it's because everybody feels that important things are always happening, every day. Take my department. We provide clays, bonding agents and sand additives for the foundry industry; filter aids for beer, sugar and pharmaceuticals—and processed earths for a whole variety of carrier and filler applications. It's my department, too, that sells many specialized products for the paint industry. In short, we're interested in everything from paper, plastics and printing inks to filtration and foundry work—and a lot more! Yes, in my department, there's always something new going on. At Berk, we feel, we're helping to push progress just a little faster all the time.

If you need information or advice on any chemical problem, ask Berk about it. Somewhere in the wide range of Berk literature, the answer may already exist; and if it does not, Berk experts will gladly set to work to find it. Write or telephone:

**F. W. BERK & CO. LTD.**BERK HOUSE, 8 BAKER STREET, LONDON, W.1. Telephone: HUNter 6688
Manchester • Glasgow • Belfast • Swansea

NEW PATENTS

By permission of the Controller, H.M. Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from: the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 3s 6d including postage; annual subscription £8 2s.

Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

AMENDED SPECIFICATIONS

On Sale 30 August

Dyestuffs of the anthraquinone series. Ciba Ltd. 843 949

ACCEPTANCES

Open to public inspection 6 September

Production of omega-lauric lactam. Badische Anilin- & Soda-Fabrik AG. 876 946
Polymerisation process. Solvay et Cie. 876 464
Tertiary amines. Farbenfabriken Bayer AG. 876 465
Self-supporting explosive compositions and their production. Du Pont de Nemours & Co., E. I. 876 951
Alkali metal polymerisation catalyst. Esso research & Engineering Co. 876 587
Polymerisation catalyst compositions. Shell Internationale Research Maatschappij N.V. 876 659
Carbonylation. Union Carbide Corp. 876 952
Method of polymerisation of vinyl acetate. Kurashiki Rayon Kabushiki Kaisha. 876 660
Polymerisation of formaldehyde. Farbenfabriken Bayer AG. 876 515
Method of stabilising olefin polymers and articles obtained therefrom. Montecatini. 876 762
Polymerisation catalysts and the production of polyethylene therewith. Grace & Co., W. R. 876 953
Antibacterial agents. Beecham Research Laboratories Ltd. 876 516, 876 662
Production of polyethylene and catalysts thereof. Grace & Co., W. R. 876 955
Carbamic acid esters and means of producing same. Parke, Davis & Co. 876 588
Process for the manufacture of highly polymeric copolymers of acetaldehyde. Consortium für Elektrochemische Industrie GmbH. 876 956

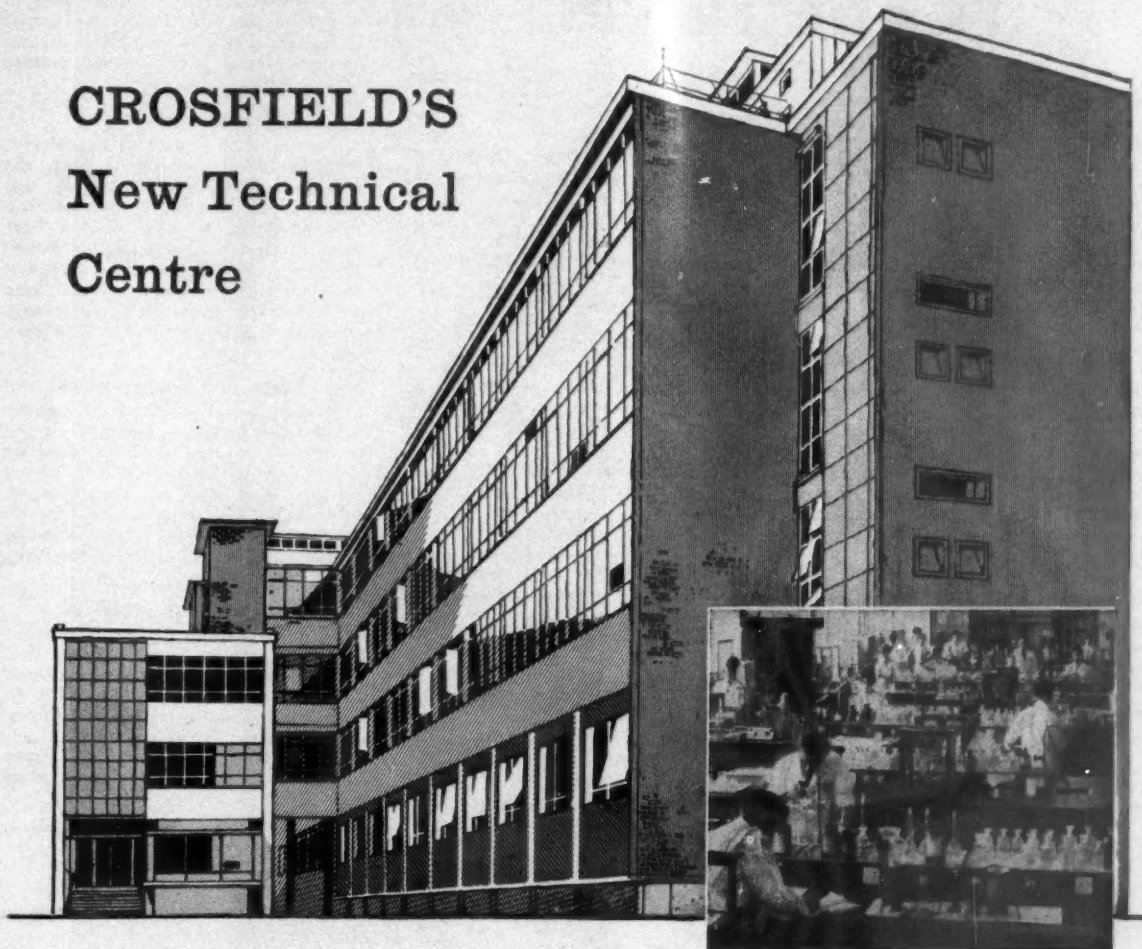
Open to public inspection 13 September

Fuel cells. National Research Development Corp. 877 410
Polymerisation of olefins, catalysts for such polymerisation, crystalline material suitable as components of the catalysts and processes for their preparation. Imperial Chemical Industries Ltd. 877 059
Method for the production of melamine. Neuber, R. 877 609
Manufacture of vinyl esters. Vinyl Products Ltd. 877 103
Production of an ammonium nitrate fertiliser composition. Chemical Construction (G.B.) Ltd. 877 411
Manufacture of pyrazole-pyrimidines. Ciba Ltd. 877 130
Vat dyestuffs of the acedanthrone series and process for their manufacture. Ciba Ltd. 877 487
Polymer blends. Canadian Industries Ltd. 877 236
Substituted urea complex salts. Merck & Co. Inc. 877 106
Preparation of polyoxyalkylene compounds. Shell Research Ltd. 877 269
Copolyesters. Goodyear Tire & Rubber Co. 877 539
Water-soluble dyestuffs, of the acridone, thioxanthone and thioxanthone-S-dioxide series, their manufacture and use. Ciba Ltd. 877 456
Process for removing iron carbonyl compounds

from oxo reaction products. Farbwerke Hoechst AG. 877 237
Process for the polymerisation of lower α -olefins. Farbwerke Hoechst AG. 877 457
Manufacture of cellular polymeric materials. Imperial Chemical Industries Ltd. 877 289
Process for the production of chromium hexacarbonyl. Montecatini. 877 109
Fluoroperhalocarbon compounds and electrolytic methods of preparing such compounds. Minnesota Mining & Manufacturing Co. 877 331
Steroid compounds. Merck & Co., Inc. 877 085
Preparation of permonosulphates. Laporte Chemicals Ltd. 877 232
Water-soluble azoazomethine chromium-containing dyestuffs. Geigy AG, J. R. 877 461
Polymerisation of ethylene. Distillers Co. Ltd. [Divided out of 865 407.] 877 080
Process for carrying out hydrocarbon cracking and condensation reactions. Deutsche Gold- und Silber Scheideanstalt. 877 241
Process for the manufacture of aqueous pigment preparations containing water-insoluble hardenable resins. Ciba Ltd. 877 235
Processes for the preparation of sulphur halogen compounds. Imperial Chemical Industries Ltd. 877 458
Water-insoluble monoazo-dyestuffs. Ciba Ltd. 877 293
Steroids and the manufacture thereof. Upjohn Co. 877 585
Preparation of benzothiadiazine-1,1-dioxide derivatives. Merck & Co., Inc. 876 995
Preparation of sulphonamides. Merck & Co., Inc. 877 056
Carbonatoalkyl acrylates and methacrylates and method for preparing same. Rohm & Haas Co. 877 243
Process for the production of natural phospholipids and related substances. Lappe, R., Lappe, W., Eikermann, N., and Grieshaber-Lappe, R. 877 031
Production and stabilisation of dichlorobutene. Distillers Co. Ltd. 877 586
Peroxides and a process for their manufacture. Farbwerke Hoechst AG. 877 244
Amine salts of substituted methanes and polymers thereof. Uclaf. 877 245
Phenolic resins. Imperial Chemical Industries Ltd. 877 080
Veterinary preparations containing antibiotics. Glaxo Laboratories Ltd. [Addition to 686 693.] 877 459
Therapeutic anti-depressant compositions comprising hydrazine derivatives. Warner-Lambert Pharmaceutical Co. 877 464
Method of processing polyester film. Goodyear Tire & Rubber Co. 877 540
Production of chlorocyanuric acids. Monsanto Chemical Co. [Addition to 825 929.] 877 588
Oxidation of alkyl-naphthalenes. Aries, R. S. 877 082
Polyazo triazine dyestuffs. Imperial Chemical Industries Ltd. 877 249
2,3,4,6-Tetra-iodobenzolic acid and derivatives thereof. May & Baker Ltd. 877 495
Apparatus and process for carrying out liquid phase chemical reactions. Celanese Corporation of America. 877 271
Elastomer adhesives and method of employing same. Borg-Warner Corp. 877 035
Thiophosphoric acid esters. Farbenfabriken Bayer AG. 877 470
Water-insoluble mono- and di-azo dyestuffs. Imperial Chemical Industries Ltd. 877 250
Polyazo triazine dyestuffs. Imperial Chemical Industries Ltd., Andrew, H. F., and Pearson, K. W. 877 178
Alkyl-hydrazine. Ciba Ltd. 877 589
Derivatives of acetylenic carbinols. Beecham Research Laboratories Ltd. 877 497
Production of olefinic hydrocarbons. British Petroleum Co. Ltd., Porter, F. W. B., and White, P. T. 877 038
Manufacture of halogen-substituted isoindolones. Geigy AG, J. R. 877 039
Disazo dyestuffs and their use. Geigy AG, J. R. 877 180
Method for preparing alkali metal hydrides. Metal Hydrides, Inc. 877 510
Surface-active basic polyethers. Olin Mathieson Chemical Corp. 877 062
Anthraquinone dyestuffs. Imperial Chemical Industries Ltd. 877 591
Compounds of the beta-cyclogeranylidene series.

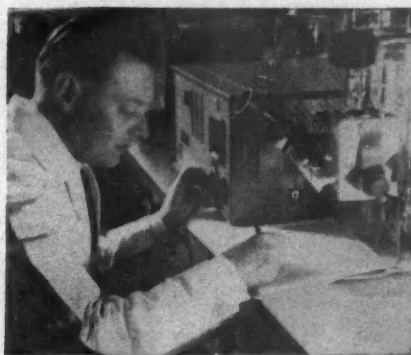
Badische Anilin- & Soda-Fabrik AG. 877 351
Purification of a vitamin A intermediate. Pfizer & Co., Inc., Chas. 877 556
Preparation of diphosphines. Imperial Chemical Industries Ltd. 877 592
Stabilised linear polyester compositions. Goodyear Tire & Rubber Co. 877 541
Halogenated derivatives of tetrahydro-1-naphthyl cyclic amidines. Pfizer & Co., Inc., Chas. 877 396
Opaque liquid detergent composition. Hedley & Co. Ltd., Thomas. [Addition to 847 712.] 877 155
Monoazo dyestuffs containing haloacylamino groups and their use. Geigy AG, J. R. 877 307
Low-temperature purification of carbon dioxide. Distillers Co. Ltd. 877 091
Alkyl-dichlorobenzoic acids and their use as herbicides. Heyden Newport Chemical Corp. 877 067
Recovery of acrylonitrile. Distillers Co. Ltd. [Addition to 835 962.] 877 474
Steroid derivatives. Laboratoires Francais de Chimiotherapie. 877 024
Aromatic carboxylic acids. Duncan, Flockhart & Co. Ltd., Simpson, W. T., Rylance, H. J., Farquharson, M. E., and Lightowler, J. E. 877 355
Vulcanisable rubber-like compositions. Imperial Chemical Industries Ltd. 877 225
Preparation of alkylated phenols. Esso Research & Engineering Co. 877 356
Caffeine-(8)-alkanolamines and their derivatives. Krugmann, T., and Krugmann, M. [trading as Krugmann & Co.] 877 358
Flameless reaction of sulphur-containing gaseous hydrocarbons to form carbon monoxide and hydrogen. Badische Anilin- & Soda-Fabrik AG. 877 359
Method of extractive distillation of an organic ester-alcohol system using water as the extractive agent. Kurashiki Rayon Kabushiki Kaisha. 877 360
Production of alpha-beta-unsaturated carboxylic acids and their esters. Badische Anilin- & Soda-Fabrik AG. 877 361
Purification of halosilanes. Westinghouse Electric Corp. 877 477
Polyalkenyl compounds and polymers thereof. Goodrich Co., B. F. 877 362
Process for the polymerisation of vinyl chloride and polymeric compositions. Shin-Etsu Chemical Industry Co. Ltd. 877 100
Cross-linked polyepoxide-thermoplastic resin compositions. Swift & Co. [Divided out of 861 971.] 877 133
Polyethers. Swift & Co. [Divided out of 861 971.] 877 134
Cross-linked polyetherpolyanides. Swift & Co. [Divided out of 861 971.] 877 135
Polyesters. Swift & Co. [Divided out of 861 971.] 877 136
Stabilisation of polyoxymethylene. Du Pont de Nemours & Co., E. I. 877 256
Catalysts for the preparation of trans 1,4 polyisoprene (synthetic balata) and methods for their preparation and use. United States Rubber Co. 877 371
Production of steroid compounds, and the compounds thus produced. Laboratoires Francais de Chimiotherapie. 877 227
Production of unsaturated alcohols from epoxides. Chemische Werke Hüls AG. 877 138
Process for the production of alpha,beta-unsaturated alcohols with more than three carbon atoms. Chemische Werke Hüls AG. 877 139
Thermoplastic resinous compositions. Food Machinery & Chemical Corp. 877 391
Selective hydrogenation. Esso Research & Engineering Co. 877 143
Manufacture of pyrazole-pyrimidines. Ciba Ltd. [Divided out of 877 130.] 877 131
Stress-crack resistant polyethylene compositions. Union Carbide Canada Ltd. 877 128
Method for the preparation of 2,2,1-bicycloheptadiene. Rumania, Ministerul Industriei Petroliului Si Chimiei. 877 119
Coloured polymers. Badische Anilin- & Soda-Fabrik AG. 877 492
Production of organic nitrogen compounds. Rhône-Poulenc. 877 483
Antibacterial agents. Beecham Research Laboratories Ltd. 877 120
Substituted dihydrobenzo thiadiazines. Olin Mathieson Chemical Corp. 877 552
Process for the production of α cyan- β -alkyl- β -phenyl acrylic esters. Farbenfabriken Bayer AG. 877 407
Substituted acrylamidopenicillanic acids. Beecham Research Laboratories Ltd. 877 531

CROSFIELD'S New Technical Centre



Main Laboratory.

New buildings . . . new outlook . . . new future. Crosfields are planning for tomorrow. As more and more of the limitless possibilities of silicates are uncovered, there will be new products, new processes, new economies for industry. And, indirectly, better living for all. Crosfield is a name to remember in chemicals.



Coulter counter—an electronic particle counter in the lower micron range.

CROSFIELD CHEMICALS



JOSEPH CROSFIELD & SONS LIMITED
WARRINGTON · LANCASHIRE

TRADE NOTES

Specialist Equipment

A new booklet describes the range of activities of Head Wrightson Stockton Ltd., Norton Road, Stockton-on-Tees, who for many years have specialised in the design and manufacture of equipment for chemical plants and iron and steel works in addition to their more traditional lines for the mining industry. The booklet discusses the company's research and development, design and manufacturing activities and illustrates items of specialist equipment.

Laboratory Apparatus

A catalogue of apparatus for the laboratory and industry which is made of rubber, synthetics and plastics is available from Laboratory Apparatus and Glass Blowing Co., 77 Grosvenor Street, Manchester 1. The company produces apparatus made of polythene, p.v.c., nylon, Perspex, silicone, neoprene and p.t.f.e.

Precipitators

A new division to handle the design, construction and installation of electrical and mechanical precipitators is announced by Joy-Sullivan Ltd., 10 Great North Road, Newcastle upon Tyne 2. This move is the result of the merging, in 1959, of Western Precipitation Corp., of Los Angeles with Joy Manufacturing Co., of Pittsburgh, parent company of Joy-Sullivan Limited.

Chiefly concerned with equipment for

the control and recovery of particulate matter in industrial gases, the range of plant to be offered will include precipitators—of both electrical and mechanical types—filters, scrubbers, and certain processing and heating equipment. The products have wide applications in the field of power generation, cement manufacturing, and in the chemical, gas, iron and steel and metallurgical industries.

Salt Bath Furnaces

A range of salt bath furnaces for hardening, tempering, annealing, cyaniding and other operations, at temperatures of up to 1,400°C, is described in a booklet issued by Efco Furnaces Ltd., Queens Road, Weybridge, Surrey.

Water Scale Prevention

The Aquastat electrical method of preventing hard water scale, embodied in a simple, compact unit which can be fitted in a pipeline, with the control box mounted adjacent to it, is described in an illustrated booklet from Aquastat Ltd., Romney House, Tufton Street, London S.W.1. Examples of Aquastat applications given in the booklet include oil refineries, chemical and plastics manufacturers.

New Tioxide Pigment

Tioxide A-PP has been added to the British Titan Products' range of pigments to overcome discoloration problems

which occur under certain conditions in plastics manufacture. It also has special advantages in the aqueous leather finishes. Tioxide A-PP is a fine particle anatase type pigment.

Magnetic Separators

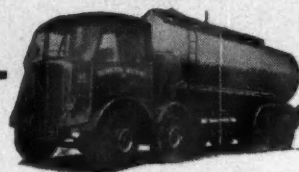
Four types of magnetic separators—pulley or drum, suspension, chute, and stand-type swarf separators—are described in the recently revised technical description No. 315 now available from the General Electric Co. Ltd. at Witton, Birmingham 6. Information contained in the previous publication has been up to date and particulars of a new range of magnetic separator pulleys have been included.

Magnetic Oxygen Meters

Magnetic oxygen meters have been developed for the determination of oxygen concentrations using methods based on the high paramagnetic susceptibility of the gas. Two types of instrument are available they are described in list 281/2 available from the Cambridge Instrument Co. Ltd., 13 Grosvenor Place, London S.W.1.

I.C.I. Silcoset Rubbers

Five of the I.C.I. Nobel Division 'Silcoset' silicone rubbers have been given provisional Ministry of Aviation D.T.D. 900 approval for use for (a) caulking and sealing of aircraft, (b) potting and encapsulation of electrical and electronic components and (c) fabrication of silicone rubber components where D.T.D. 818 is not applicable.



LIQUIDS IN BULK

We are specialists in the bulk transport of the following

ACIDS • CHEMICALS • ALKALIS
SOLVENTS • CAUSTICS • EMULSIONS
PETROLEUM • PRODUCTS

Continental Enquiries Welcomed

MONKTON MOTORS LTD.

WALLINGFORD ROAD, UXBRIDGE, MIDD.

Telephone : UXBRIDGE 35574/5

Monochloroacetic Acid Sodium Monochloroacetate

C567-E

HOECHST CHEMICALS LTD.

50, Jermyn Street, London, S.W.1 · Tel. HYD. 7534
75, Piccadilly, Manchester, 1 · Tel. Central 2234/5
115-117, Colmore Row, Birmingham · Tel. Central 6046/7



CLASSIFIED ADVERTISEMENTS

CLASSIFIED RATES: All sections 5d. per word. Minimum 8/- . Three or more insertions 4d. per word. Box Number 2/- extra.

SEMI-DISPLAY: 30/- per inch. Three or more insertions 25/- per inch.

PATENTS & TRADE MARKS

The Proprietors of Patent No. 777290 for "Improvements in or relating to Manufacture of Benzene Hexachloride" and 779332 for "Improvements in or relating to Manufacture of Benzene Hexachloride" desire to secure commercial exploitation by Licence or otherwise in the United Kingdom. Replies to **HASELTINE LAKE & CO.**, 28 Southampton Buildings, Chancery Lane, London, W.C.2.

PLANT AND MACHINERY FOR SALE

Baker-Perkins Class BB "Double Naben" Bladed Steam Jacketed Mixers. Four—size 12 and Three—size 11, of 20 and 8 gallons respectively.

Oil Jacketed Double Trough Mixer 48 in. by 36 in. by 29 in. deep. Paddle Blades. Bottom Outlets.

Barron 'U' Sifter Mixer 96 in. by 33 in. by 33 in. with 10 H.P. A.C. Motor.

Gardner 'U' Sifter-Mixers 66 in. by 24 in. by 24 in. with 5 H.P. A.C. Motors. Four available, of modern streamlined design.

Horizontal 'U' Trough Mixers 48 in. by 18 in. by 22 in. Three—Tilting type, Paddle Blades. Glanded.

Over-Arm Twin-Blade, Tilting, 30 gallon Mixers with 3 H.P. Geared Motors. Five available.

Lying at our No. 2 Depot, Willow Tree Works, Swallowfield, Berkshire.

Apply: **Winkworth Machinery Limited**, 65 High Street, Staines, Middlesex. Telephone 55951.

Phone 55298 Staines

STAINLESS STEEL PLANT

S.S. Tanks 500, 400 and 220 galls. Cyl. Conical Bottoms.

S.S. Mixing Tank—300 galls. A.C.

S.S. Jac. Pasteurisers/Mixers 50, 100 and 150 galls.

S.S. Rect. Tanks 850 and 450 galls.

S.S. Spherical Still 6 ft. 6 in. diam.

S.S. Duplex 'Z' Mixer (Vacuum) 3 ft. by 3 ft. by 3 ft. deep.

S.S. Worm Conveyor—Trough 10 ft. by 5 in. by 5 in.

S.S. Homogeniser $\frac{1}{2}$ H.P. 1,000 p.s.i. 25 g.p.h.

S.S. 'Hurrell' Homogeniser 5 H.P. 400/3/50.

Glass Lined Tanks 1,300, 2,000, 3,000, 3,250 and 3,600 galls.

(2) Jacketed Glass Lined Tanks 2,000 galls. each.

Mixers, Hydros, Condensers, Still, Retorts, Reactors, etc.

Send for Lists.

HARRY H. GARDAM & CO. LTD.,
100 CHURCH STREET, STAINES.

Seven—Lithcote Lined 15,000 gallons capacity Vertical M.S.

Storage Vessels 23 ft. high \times 12 ft. dia. in excellent condition.

G. E. Simm (Machinery) Limited,

27, Broomgrove Road,

Sheffield, 10.

Telephone: 64436

REPRESENTATIVE

Gentleman returning to Copperbelt, Northern Rhodesia in September, willing to represent company interested in copper mining and other industries. Write **Box No. 3759, Chemical Age**.

SITUATIONS VACANT

THE INTERNATIONAL NICKEL COMPANY (MOND) LIMITED

requires a

DEVELOPMENT OFFICER

to stimulate and expand chemical applications of nickel and its compounds. The successful applicant will be concerned with assessing development trends in pure and applied chemistry by technical liaison with industrial and research establishments in the U.K. and on the Continent. Fields of interest include catalysis, co-ordination chemistry and agriculture. Candidates, under 40 years of age, should have sound scientific training, and experience in the chemical industry, together with outstanding enthusiasm and aptitude for this type of work.

Pension and assurance schemes are in operation and, in appropriate cases, assistance can be given with housing.

Apply, giving full particulars of qualifications, experience, age, salary required, etc., to The Manager, General Division, Development and Research Department, The International Nickel Company (Mond) Limited, Thames House, Millbank, London, S.W.1. Mark envelope "Confidential D.34V."

ASSISTANT WORKS CHEMIST REQUIRED, RESPONSIBLE FOR QUALITY CONTROL OF RAW MATERIALS, FINISHED PRODUCTS, CUSTOMERS COMPLAINTS AND SOME DEVELOPMENT WORK. APPLY GIVING BRIEF DETAILS OF AGE, EXPERIENCE, QUALIFICATIONS, ETC. PERSONNEL DEPT. Box No. 3760.

WORK WANTED & OFFERED

CRUSHING, GRINDING, MIXING and DRYING for the trade
THE CRACK PULVERISING MILLS LTD.

Plantation House,
Mixing Lane,
London, E.C.2.

PULVERISING of every description of chemical and other materials. Collections, storage, deliveries. **THOMAS HILL-JONES, LIMITED, INVICTA WORKS, BOW COMMON LANE, LONDON, E.3. (TELEPHONE: EAST 3285.)**

BOX NUMBERS: Reply c/o "Chemical Age"

Bouverie House

Fleet Street EC4.

Chemical Age Enquiry Service

For fuller details of equipment, apparatus, chemicals etc., in the advertisement or editorial pages of Chemical Age, fill in the coupons below, ONE PER ENQUIRY, and return to us.

Please send further details about

.....

.....

mentioned on page of this issue.

Name Position

Firm

Address

.....

Chemical Age Enquiry Service.

Please send further details about

.....

.....

mentioned on page of this issue.

Name Position

Firm

Address

.....

Chemical Age Enquiry Service.

Please send further details about

.....

.....

mentioned on page of this issue.

Name Position

Firm

Address

.....

Chemical Age Enquiry Service.

★ Detach this page complete then fold as marked
overleaf to use the post-paid reply folder

2nd FOLD	
Postage will be paid by the Licensee	No Postage Stamp necessary if posted in Great Britain or Northern Ireland
1st FOLD	
BUSINESS REPLY FOLDER Licence No. 2501	
CHEMICAL AGE 154-160 FLEET STREET LONDON, E.C.4	
3rd FOLD	

Chemical Age

ENQUIRY SERVICE



This is a special service for
readers of

CHEMICAL AGE

It is designed to give fuller
information on equipment,
apparatus, chemicals etc.,
mentioned in this issue—
whether in the editorial text
or in an advertisement

Cut out the whole of this page,
fold as instructed with post-
paid address on the outside



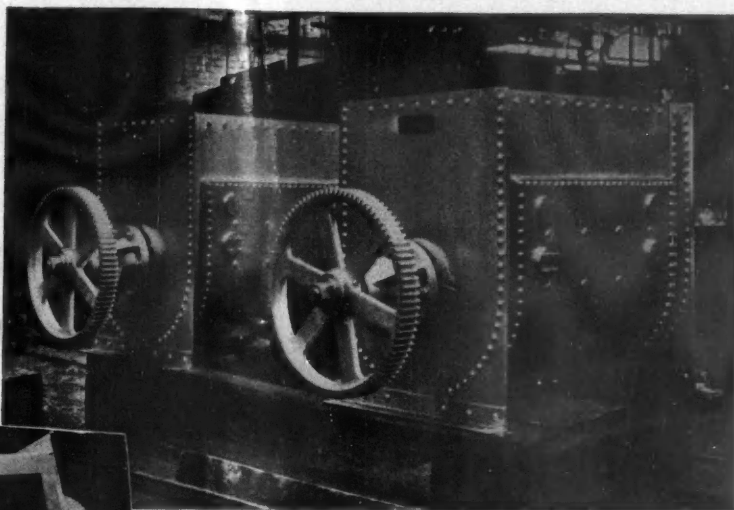
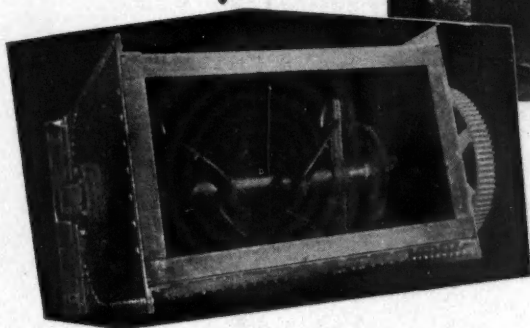
Chemical Age

154 Fleet Street, London, E.C.4

Tel.: Fleet Street 3212

CUT ALONG THIS DOTTED LINE

MIXING VESSELS



These hot water jacketed Mixing Vessels (capacity $\frac{1}{2}$ Ton each) are for use in chocolate manufacture. The lower photograph shows the stirring gear.

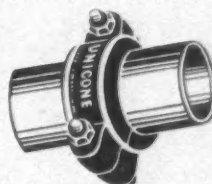
• • •

We manufacture Mixers, Blenders and Process Vessels for a wide range of Industries and applications.

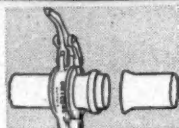
POTT, CASSELS & WILLIAMSON LTD • MOTHERWELL • SCOTLAND
A Member of THE MIRRLEES WATSON GROUP

INSTANTANEOUS JOINTS

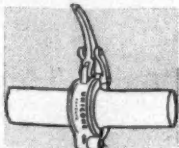
*Leakproof.
safe...
reliable!*



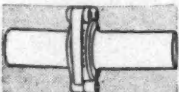
For permanent or semi-permanent pipelines 'UNICONE' bolted pipe joints are employed.



Rubber gasket in position and joint ready to pull over.



Pipe ends joined ready for locking.



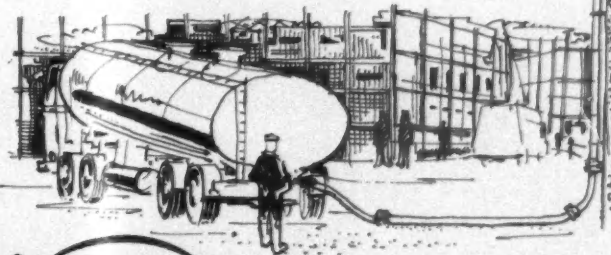
The completed joint.

For temporary pipe lines 'Unicone' instantaneous joints are recommended. Comprising two parts only, they fasten with a "snap" ensuring a perfect seal in a matter of seconds.

For permanent or semi-permanent pipelines, 'Unicone' bolted type joints are usually employed and can be assembled far more quickly than any other flexible joint giving positive anchorage.

A perfect joint in a matter of seconds...

The 'Unicone' system of pipe-jointing, with its time and labour saving features, produces a pipe line which is flexible while remaining absolutely leak-proof.



THE UNICONE CO., LIMITED
RUTHERGLEN, GLASGOW, SCOTLAND

lithium

Available for quick delivery:—

Lithium metal—98/100%
 Lithium carbonate—98/99%
 Lithium hydroxide monohydrate—53/56% LiOH
 Lithium hydroxide anhydrous
 Lithium chloride anhydrous
 Lithium fluoride—98%
 Lithium phosphate
 Lithium nitrate trihydrate 53/55% LiNO_3
 Lithium sulphate monohydrate—80/83% Li_2SO_4
 Lithium bromide liquor 52/54% LiBr
 Lithium acetate
 Ground petalite 4.4% Li_2O

Enquiries invited for compounds not listed

ASSOCIATED LEAD

Manufacturers Limited

Special Chemicals Division,
 Crescent House, Newcastle upon Tyne 1.



The heat shock resistance of pure fused silica, working temperature of 1050°C., heat transfer and good electrical insulation make VITREOSIL muffles the ideal furnace lining. Used with VITREOSIL trays, any risk of contamination in firing, sintering or heat treatment is eliminated. In standard sizes to suit most requirements.

THE THERMAL SYNDICATE LTD.

P.O. BOX NO. 6 WALLSEND, NORTHUMBERLAND.
 LONDON: 9 BERKELEY STREET, W.1.

Tel: Wallsend 62-3242/3
 Tel: Hyde Park 1711/2



